APPENDIX V

Engineering Calculations and Cost Estimates for Remedial Alternatives



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APPENDIX V ENGINEERING CALCULATIONS AND COST ESTIMATES FOR REMEDIAL ALTERNATIVES

This appendix presents the physical dimensions and cost estimate calculations for all remedial alternatives established by the feasibility study (FS).

ENGINEERING CALCULATIONS

Surface areas and material volumes were calculated for each site containing impacted environmental media. Areas were calculated from digital topographic base maps using geographical information system mapping software by delineating the polyginal region on the maps.

For the unexploded ordnance (UXO) sites, the extents of UXO impact were determined by on-site surveys. Where possible, a test lane was surveyed to locate and identify ordnance on each site for purposes of estimating the total number of UXO items across the site. The total quantity of UXO items at each site was determined by assuming that the density of ordnance in the test lane is the same as the entire site. Results of the surveys are presented below.

- SWMU 1 was determined to include a total area of approximately 890 acres. The actual test lane surveyed to identify UXO items was 10 feet wide and 6,500 feet long, or 1.5 acres in size. The survey identified two ordnance items within the test lane for a density of 1.3 UXO items per acre. As a result, a total of 1,187 UXO items are potentially present throughout the site.
- SWMU 2 was determined to include a total area of approximately 45 acres. A test lane was not constructed across the site because of hazards associated with land mines in rugged terrain. Since this area is a minefield, the density of items is likely high, which translates to high potential risk for clearance efforts.
- SWMU 8 was determined to include a total area of approximately 25 acres. The site comprises a landfill, a beach fortification area, and the beach front. Only the landfill was fully surveyed since the other two areas contain personnel hazards.

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The actual test lane surveyed to identify UXO items encompassed the entire surface of the landfill and adjacent areas, which is approximately 5 acres in size. The survey identified 82 ordnance items on the surface and an additional 52 items in the subsurface following detonation of the surface items. This indicates that a large quantity of UXO items potentially exists at this site. However, no specific estimate can be made without further excavation given the high density of ordnance.

• SA 93 was determined to include a total area of approximately 380 acres. The actual test lane surveyed to identify UXO items was 10 feet wide and 2,200 feet long with an additional 0.25 acre surveyed in a spoked wheel pattern for a total of 0.75 acre. The survey identified six ordnance items within the test lane for a density of eight UXO items per acre. As a result, a total of 3,040 UXO items are potentially present throughout the site.

For landfills, the extent of impacted environmental media was determined by on-site field measurements made in test pits and boreholes. From these locations, both the areal extent of the landfill and the depth of landfill contents were determined. The volumes of impacted environmental media in the landfill areas were based on the chemical concentrations at these locations. Survey results for each of the landfills are presented below.

- SWMU 2 was determined to include a total area of approximately 4.5 acres. However, some monitoring locations did not contain chemical concentrations sufficient to adversely impact the soil. As a result, the extent of impacted soils was estimated based on distance from locations for which a total of 3.6 acres was determined to be impacted. An estimated depth of 8 feet was then used to determine the volume of impacted soils.
- SWMU 4 was determined to include a total area of approximately 3.8 acres. Based on aerial photographs and the position of the access road, the entire portion of the site north of the road was included in the area estimate. Volume of the impacted soils was based on the depth of the landfill, which is 8 feet.
- SWMU 29 was determined to include a total area of approximately 5.8 acres. The entire area was assumed to contain impacted soil at a depth of 10 feet based on chemical concentrations at the sampling locations.

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For sites other than UXO sites and landfills, the survey results are presented below for both areas and volumes of impacted environmental media.

- SWMU 17 was determined to contain impacted environmental media in several areas. The extent of surface water is approximately 0.6 acre with an estimated volume of 235,000 gallons. However, this volume is variable due to weather conditions and surface water runoff. Areas and depths of chemicals in soil and sediment are based on chemical concentrations from boreholes and excavations established during various field investigations. Only areas perennially covered with water were considered to contain sediment, which include the former waste oil pit, retention pond, and Yakutat Creek. The overall surface area of the sediments was determined to be 1.1 acres at a depth of 1 foot. Impacted soil and areas containing surface soil that are seasonally covered with water such as the roadside ditches and depressed areas that hold water for a prolonged period were determined to be 1.4 acres at a depth of 3 feet.
- SWMU 10 product/waste storage area was determined to contain impacted soils within the site boundary of 2.4 acres. Since only a portion of the soil is impacted, field sampling and analysis will need to be conducted to relocate the impacted areas.
- SWMU 20 drum disposal area was determined to contain approximately 10 cubic yards of impacted sediments in a specific area in the Trout Creek floodplain. The impacted sediments are just below ground surface at 0.5 to 1.5 feet in a small area originally occupied by drums. This is an estimate since the area will require confirmation sampling following the previous interim removal action.
- SWMU 27 drum disposal area was determined to contain impacted sediments encompassing the entirety of the lake at approximately 0.2 acre and a depth of 1 foot. This is an estimate since the sediments have not been characterized throughout the lake.
- South Sweeper Creek was determined to contain impacted sediments in the reach that parallels the runway for about 2,000 feet above the Bayshore Highway bridge. This area encompasses approximately 4.5 acres with a depth of 1 foot.
- Sweeper Cove was determined to contain approximately 450 acres of sediments within the area enclosed by the harbor jetty. Impacts of the chemicals within the

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cove appear to be ubiquitously distributed with no clearly defined "hotspots." Areas of higher chemical concentrations are considered likely to be redistributed over time due to tides and currents. Thus, for estimation purposes, the depth of impacted sediments throughout the cove was assumed to be 1 foot.

COST ESTIMATES FOR REMEDIAL ALTERNATIVES

As defined and discussed in technical guidance (U.S. EPA 1987), cost estimates provide the total resource costs over time associated with each remedial alternative. The development of cost estimates involved both estimates of capital and operation and maintenance (O&M) costs, and a present worth analysis of annual costs for each alternative. Activities associated with capital costs typically involve work that is limited in duration, causes chemical levels to be reduced a measurable amount, and yields significant protection to human health and the environment. Similarly, activities associated with O&M costs typically involve work required to maintain the effectiveness following completion of the remedial action, to stop or control continued chemical migration, and to extend over a specified period of time.

Capital costs consist of both direct and indirect costs. Direct capital costs are those related to the installation of the remedial action, as follows:

- Remedial action construction
- Equipment and materials
- Land and site development
- Buildings and related services
- Disposal of waste materials
- Relocation of facilities and population

Indirect capital costs are those related to necessary services that are not a part of the actual installation of the remedial action, as follows:

- Engineering
- Financial and legal
- Supervision
- Design and development
- Monitoring and testing
- Contingency allowances

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- System start-up and debugging
- Licenses and permitting
- Other services

O&M costs are those related to post-construction and installation activities necessary to ensure continued effectiveness of a remedial action, as follows:

- Operating labor (by skill category)
- Maintenance (materials and labor)
- Auxiliary materials and energy
- Services (professional and vendor)
- Administrative
- Insurance, taxes, and licenses
- Contingency costs
- Other costs

The primary area of uncertainty in developing unit costs for remedial alternatives at NAF Adak is the availability of existing infrastructure, including utilities, housing, equipment, personnel, and structures. Based on current schedules for closure according to Base Closure and Realignment Act (BRAC), the Navy intends to evacuate Adak Island by the end of 1997. Hence, for all remedial action alternatives, it is assumed that all work will be performed in a remote environment with little to no infrastructure support from the Navy. Because the accuracy of an FS cost estimate is intended to be in the -30 to +50 percent range, only those major cost elements expected to significantly affect the overall level of accuracy are addressed. The primary cost elements that affect the accuracy of cost estimates are identified below.

- **Utilities** include potable water, sanitary sewer system, wastewater treatment (for both sanitary waste and [potentially] treatment for chemical contaminants), electrical service, and motor vehicle fuel.
- **Housing** and food will be major cost components, depending on availability and the cost of maintaining existing housing facilities.
- Equipment availability will significantly affect mobilization costs, depending on what equipment is already on the island. This may include drill rigs, earthwork equipment, trucks, a pug mill, a rock crusher, generators, pumps, tools, spare parts, etc.

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- **Personnel** present on island and available for support roles may significantly affect costs. Key positions may include cooks, mechanics, equipment operators, and contractors. Support personnel will have to be mobilized and stationed on the island if they are not already available.
- **Structures** potentially available for use in treatment alternatives may significantly reduce costs. Existing storage tanks, hangars, offices, or concrete pads could be used if available.

Once the status of these infrastructure components is known, appropriate unit costs can be developed. A fairly comprehensive list of available infrastructure, along with any associated costs to the Navy of providing such infrastructure, would need to be quantified for the preferred alternative.

Table V-1 presents a summary of costs for remedial alternatives presented in this appendix. Tables V-2 through V-31 provide detailed costs for alternatives previously developed and evaluated for non UXO sites. These tables are organized into the same cost categories and cost elements presented above. Table V-32 shows the various cost elements considered for remedial alternatives in support of the detailed cost tables. To relate the detailed costs for alternatives to the individual cost elements, Table V-33 lists the assumptions established for the remedial alternatives by site type and assumption category used in the development of costs. Finally, Tables V-34 through V-48 provide detailed costs for alternatives associated with various types of UXO clearance.

REFERENCES

U.S. Environmental Protection Agency (U.S. EPA). 1987. Remedial Action Costing Procedures Manual. EPA/600/8-87/049. October 1987.

		Table V-1	
	Summary	of Costs by Remedial A	Alternative
Remedial Alternative	Capital (\$)	Annual O&M (\$)	Total Present Worth Cost (\$)
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
Alternative 1 - No Action			
All FS Sites	0	0	0
Alternative 2 - Institutional			
Controls			* · · · · · · · · · · · · · · · · · · ·
SWMU 2 (LF)	14,000	37,000	327,000
SWMU 4 (LF)	14,000	37,000	328,000
SWMU 29 (LF)	14,000	45,000	389,000
SWMU 10 (P/W)	12,000	21,000	186,000
SWMU 17 (P/W)	12,000	39,000	339,000
SWMU 20 (DDA)	0	26,000	222,000
SWMU 27 (DDA)	0	23,000	191,000
Sweeper Cove (RWB)	22,400	25,000	246,000
South Sweeper Creek (RWB)	16,200	18,000	253,000
Kuluk Bay (RWB)	22,000	26,000	244,000
Alternative 3 - Containment			
SWMU 2 (LF)	163,000	37,000	475,000
SWMU 4 (LF)	152,000	37,000	466,000
SWMU 29 (LF)	249,000	44,000	624,000
SWMU 10 (P/W)	400,000	21,000	574,000
SWMU 17 (P/W)	305,000	138,000	1,470,000
SWMU 27 (DDA)	180,000	23,000	371,000
Sweeper Cove (RWB)	19,885,000	25,000	20,100,000
South Sweeper Creek (RWB)	647,000	28,000	884,000
Alternative 4 - Removal:			
SWMU 10 (P/W) - Option 1	1,095,000	0	1,095,000
SWMU 10 (P/W) - Option 2	1,166,000	0	1,166,000
SWMU 17 (P/W) - Option 1	4,701,000	138,000	5,866,000
SWMU 17 (P/W) - Option 2	3,770,000	138,000	4,936,000
SWMU 20 (DDA) - Option 1	110,000	0	110,000
SWMU 20 (DDA) - Option 2	110,000	0	110,000
SWMU 27 (DDA) - Option 1	284,000	0	284,000
SWMU 27 (DDA) - Option 2	291,000	0	291,000
Sweeper Cove (RWB) - Option 1	24,312,000	25,000	24,526,000
Sweeper Cove (RWB) - Option 2	313,623,000	25,000	313,836,000
South Sweeper Creek (RWB) - Option 1	810,000	28,000	1,047,000
South Sweeper Creek (RWB) - Option 2	6,698,000	28,000	6,935,000
NOTES:			
All FS Sites	All FS Sites: SWMUs 2 4 1	0.17.20. 27.29. Sweeper Cove	Sweeper Creek, and Kuluk Bay
LF	Landfill Areas: SWMUs 2, 4		enseper oreen, and haidh bay
PW	Product Waste Storage Are	T. Stellas and the stellas and	
DDA			
RWB	Drum Disposal Areas: SWM		Stook Kuluk Pay
O & M		weeper Cove, South Sweeper C	
Option 1	Removal and Disposal		ears 0 to 5, and every 5 years for years 6 to 30
- Priori	Removal and Treatmen		

***	Table V-2	10			
	2 - Institutio				
for Cause	way Landfill	(SWMU 2)			
			Unit		_
	Unit	Quantity	Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS			(4)	(4)	1000100
Install 3 Monitoring Wells	Each	3	2,314	6,942	CM
					-
					+
					_
					1
					-
					-
Total Direct Capital Costs				6,942	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions (No Excavation Without	Site	1	5,000	5,000	EE
Approvals/ Notifications)					
					-
					-
Cultural ladiana Constal Const					
Subtotal Indirect Capital Cost Contingency (20% Direct and Indirect Capital Costs)				5,000 2,388	-
Total Indirect Capital Costs				7,388	
TOTAL CAPITAL COSTS				14,330	
ANNUAL OPERATION AND MAINTENANCE COSTS				,,	
Monitor Groundwater at 3 Wells and Sediment at 1	Event	1	9,462	0.462	EE
Location				9,462	102.00
Landfill Monitoring Report	Event	1	4,160	4,160	EE
Inspection and repair of landfill cover& maintain vegetation	Acre	3.6	2,274	8,188	EE
Landfill Inspection/Repair Report	Event	1	4,160	4,160	EE
Periodic Site Review - Monitoring/ Inspection Results, and					1
Revaluate Status	Event	1	11,152	11,152	EE
					+
Annual O&M Costs				37,122	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				400 700	
4.33 Present Worth Annual O&M Costs (25 years, 25% per 5				160,738	-
year interval) - Factor = 2.69				99,858	
Contingency (20% of O&M Costs)				52,119	_
TOTAL O&M PRESENT WORTH COSTS (30 years)				312,716	
TOTAL PRESENT WORTH COSTS				327,046	
Notes:	107			02.,040	
CM - cost manual					
EE - engineering estimate					

Alternative 2	Table V-3	nal Controls			
for South Davis					
ioi couli burio	Ttodd Lan	(211110	,		
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS				0.040	T CM
nstall 3 Monitoring Wells	Each	3	2,314	6,942	CM
					_
		1			
		-			_
		-		6,942	-
Total Direct Capital Costs	_			0,342	
NDIRECT CAPITAL COSTS Apply landuse restrictions (No Excavation Without		T		I washing	T
Approvals/ Notifications)	Site	1	5,000	5,000	EE
Approvais/ Notifications)					
					-
					+
		-			+
Subtotal Indirect Capital Cost				5,000	
Contingency (20% Direct and Indirect Capital Costs)				2,388	
Total Indirect Capital Costs				7,388	
TOTAL CAPITAL COSTS			1	14,330	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Groundwater at 3 Wells and Sediment at 1	Event	1	9,462	9,462	EE
Location Landfill Monitoring Report	Event	1	4,160	4,160	EE
Inspection and repair of landfill cover & maintain					
vegetation	Acre	3.8	2,189	8,320	EE
Landfill Inspection/Repair Report	Event	1	4,160	4,160	EE
Periodic Site Review - Monitoring/ Inspection Results, and	Event	1	11,152	11,152	EE
Revaluate Status		_	-		+
		_			
		-			_
		+			
Annual O&M Costs				37,254	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				161,310	
Present Worth Annual O&M Costs (25 years, 25% per 5					
year interval) - Factor = 2.69				100,213	+
Contingency (20% of O&M Costs)				52,305 313,828	_
TOTAL O&M PRESENT WORTH COSTS (30 years)		-		313,828	-
TOTAL PRESENT WORTH COSTS		-		320,130	-
Notes:		-			
CM - cost manual EE - engineering estimate					
FD - former design	Ti .				
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years	rs for year	s 6 to 30			

Alternative 2	Table V-4	nal Controls			
for Finger B					
for Finger B	ay Landilli (SVVIVIO 29)			
			Unit		
	Unit	Quantity	Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS	- 4				T 614
nstall 3 Monitoring Wells	Each	3	2,314	6,942	СМ
					-
		-			
		-			
					-
					-
Total Direct Capital Costs				6,942	
NDIRECT CAPITAL COSTS	u .	VI III	Miles I to a	11/2	1111
Apply landuse restrictions (No Excavation Without	Site	1	5,000	5,000	EE
Approvals/ Notifications)	Oite	·	0,000		
					+
					+
					_
		_			
Subtotal Indirect Capital Cost				5,000	_
Contingency (20% Direct and Indirect Capital Costs)		-		2,388 7,388	+
Total Indirect Capital Costs		-	-	14,330	+
TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS				14,000	
Monitor Groundwater at 3 Wells and Sediment at 1		T		0.400	
Location	Event	1	9,462	9,462	EE
Landfill Monitoring Report	Event	1	4,160	4,160	EE
Inspection and repair of landfill cover& maintain vegetation	Acre	5.8	1,697	9,840	EE
	1 10000	100			
Landfill Inspection/Repair Report	Event	1	9,840	9,840	EE
Periodic Site Review - Monitoring/ Inspection Results, and	Event	1	11,152	11,152	EE
Revaluate Status		1			
			-		-
		_			-
Annual O&M Costs				44,454	
Present Worth Annual O&M Costs (5 years, 5%) - Factor =					
4.33				192,486	
Present Worth Annual O&M Costs (25 years, 25% per 5				140 504	
year interval) - Factor = 2.69				119,581 62,413	+
		-	-	374,480	
Contingency (20% of O&M Costs)					+
Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)			1	388 811	
Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS				388,811	
Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes:				388,811	
Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual				388,811	
Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes:				388,811	

Table V-5				1
ler Building	(SWMU 10)			
		11=14		+
Unit	Quantity		Costs (\$)	Source
1 Onit	Qualitity	Costs (#)	Costs (4)	Source
T				T
				-
				-
+				
-				
				-
-				+
			0	+
			U	
Site	1 1	5,000	5,000	I EE
Site	1	5,000	5,000	EE
	-			
	-			
			10,000	†
			2,000	
			12,000	
			12,000	
	_			EE
Event	1	3,600	3,600	EE
Event	1	11,202	11,202	EE
	-			-
				+
			20,634	
			89,345	
		_	EE FOR	_
-	-			
		-		
	-		105,021	
	Event Event Event	Event 1 Event 1 Event 1 Event 1	Event 1 5,832 Event 1 5,832 Event 1 3,600	2 - Institutional Controls aler Building (SWMU 10) Unit Quantity Costs (\$) Costs (\$) O Site 1 5,000 5,000 Site 1 5,000 5,000 Site 1 5,000 12,000 12,000 12,00

A11 11 0	Table V-6	10 11			-
Alternative 2					
for Power P	lant No. 3 (SWMU 17)			
			Unit		
ligado de jaro de la como persona de la ciencia distribución de	Unit	Quantity	Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS					
					-
		-			+
					+
		-			+
					+
					-
					-
					-
					-
					-
Total Direct Capital Costs				0	
INDIRECT CAPITAL COSTS			1 11 11 1		
Apply landuse restrictions (Industrial Site Use Only)	Each	1	5,000	5,000	EE
Apply landuse restrictions (No Excavation Without	Each	1	5,000	5,000	EE
Approvals/Notifications)	Lacii	,	2,000	2,000	
			1 1 11		-
					-
Subtotal Indirect Capital Cost				10,000	
Contingency (20% Direct and Indirect Capital Costs)				2,000	
Total Indirect Capital Costs				12,000	
TOTAL CAPITAL COSTS				12,000	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annually, inspect/repair sediment cover(s) and maintain	Event	1	17,148	17,148	EE
vegetation				10.00	
Monitor Sediment/surfacewater at 3 Locations	Event	1	6,832	6,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and	Event	1	11,202	11,202	EE
Revaluate Status	Lvent	1	11,202	11,202	
Annual O&M Costs			1 1 1	38,782	
Present Worth Annual O&M Costs (5 years, 5%) - Factor =					
4.33				167,926	
Present Worth Annual O&M Costs (25 years, 25% per 5	THE STATE OF		11 11		
year interval) - Factor = 2.69				104,324	
Contingency (20% of O&M Costs)				54,450	
TOTAL O&M PRESENT WORTH COSTS (30 years)				326,700	
TOTAL PRESENT WORTH COSTS				338,700	
Notes:				,/	_
CM - cost manual					
Civi - Cost Illanuai		+			
EE angineering estimate					
EE - engineering estimate		+			
EE - engineering estimate FD - former design O&M - operation and maintenance					

Alternative 2	Table V-7	nal Controls			
for White Alice/Trout C	reek Dieno	sal Area (SI	WMU 20)		
Tot Write Alice/11out C	reek Dispe	Sai Aica (O	71110 20)		
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
RECT CAPITAL COSTS		A section of			Flyring Hea
TEOT ON THE SOCIETY					
					-
					-
					-
		-			-
					+
Catal Diseast Comital Conta				0	
Total Direct Capital Costs					
NDIRECT CAPITAL COSTS		T			T -
					-
					+
Subtotal Indirect Capital Cost		-			+
Contingency (20% Direct and Indirect Capital Costs)					
Total Indirect Capital Costs				0	
TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS					
	Event	1	2,712	2,712	CM
Repair signs Monitoring Report	Event	1	3,600	3,600	EE
Monitor Sediment at 4 Locations	Event	1	8,832	8,832	EE
Periodic Site Review - Monitoring/ Inspection Results, and	Event	1	11,202	11,202	EE
Revaluate Status	Event	'	11,202	11,202	
		_	-		
			-		
					_
Annual O&M Costs				26,346	
Present Worth Annual O&M Costs (5 years, 5%) - Factor				114,078	
= 4.33				114,070	
Present Worth Annual O&M Costs (25 years, 25% per 5				70,871	
year interval) - Factor = 2.69				36,990	
Contingency (20% of O&M Costs)				221,939	
TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS				221,939	
				22.,000	
Notes:					
CM - cost manual EE - engineering estimate					
FD - former design					
TE TOTAL GOODS					
O&M - operation and maintenance O&M costs distributed annually for years 0 to 5, every 5 ye					_

Alternative 2 -	Drum Ren	noval/Dispos	al		
for Lake Leone Dru					
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS	The state of		图图 17 图1 See		
					-
		-			-
		-			+
		-			
Total Direct Capital Costs				0	
NDIRECT CAPITAL COSTS					
					-
					-
		-			+
		+			+
					
		+			
Subtotal Indirect Capital Cost				0	
Contingency (20% Direct and Indirect Capital Costs)				0	
Total Indirect Capital Costs				0	
TOTAL CAPITAL COSTS				0	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Sediment at 4 Locations	Event	1	7,832	7,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and	Event	1	11,202	11,202	EE
Revaluate Status	Lvont	1	7.,202		+
					-
			-		+
		-			+
		+			+
		+			+
		+			
				0	
Annual O&M Costs				22,634	
Present Worth Annual O&M Costs (5 years, 5%) - Factor					
= 4.33				98,005	
Present Worth Annual O&M Costs (25 years, 25% per 5					
year interval) - Factor = 2.69				60,885	
Contingency (20% of O&M Costs)				31,778	
TOTAL O&M PRESENT WORTH COSTS (30 years)				190,669	-
TOTAL PRESENT WORTH COSTS				190,669	
Notes:					
CM - cost manual		-			
EE - engineering estimate		+			-
FD - former design O&M - operation and maintenance		+			+

Alternative 2	Table V-9	nal Controls			
	Sweeper C				
101 0	weeper O	046			
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
IRECT CAPITAL COSTS	Office		(17)		
nstall signs along shorelines	Sign	160	138	22,056	CM
istali signs distig sits simes					
					-
					-
					-
		-			+
		-			1
					+
		-		22,056	1
Total Direct Capital Costs				22,030	
NDIRECT CAPITAL COSTS					_
Establish Restricted Subsistence and Commercial Fisheries	Site	1	5,000	5,000	EE
anduse					
					-
					+
					+
			-		+
					+
		-			+
		-			+
		_		5,000	_
Subtotal Indirect Capital Cost				5,411	_
Contingency (20% Direct and Indirect Capital Costs)				10,411	
Total Indirect Capital Costs		-		32,467	
TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS				32,407	
	Event	1 1	2,712	2,712	EE
Inspect and repair signs	Event	1	7,832	7,832	EE
Monitor Tissue at 4 Locations	Event	1	3,600	3,600	EE
Monitoring Report	Event	-			
Periodic Site Review - Monitoring/ Inspection Results, and	Event	1	11,202	11,202	EE
Revaluate Status		+			
		_			
Annual O&M Costs				25,346	
Present Worth Annual O&M Costs (5 years, 5%) - Factor =					
4.33				109,748	
Present Worth Annual O&M Costs (25 years, 25% per 5					
year interval) - Factor = 2.69				68,181	
Contingency (20% of O&M Costs)				35,586	
TOTAL O&M PRESENT WORTH COSTS (30 years)				213,515	
TOTAL PRESENT WORTH COSTS				245,982	
Notes:					
Notes: CM - cost manual					
EE - engineering estimate					
LE GIUII COINT COLINIALO		_			
FD - former design O&M - operation and maintenance					

Altornative	Table V-10				+
		onal Controls			
for So	uth Sweepe	er Creek			-
			11.2		
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS					
Install signs along shorelines	Sign	50	170	8,524	CM
		-			-
					-
					+
					+
					+
Total Direct Capital Costs				8,524	
INDIRECT CAPITAL COSTS	1 2 7	1 12 1			
Establish Restricted Subsistence and Commercial Fisheries	0"		F		T
landuse	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost		-		F 000	-
Contingency (20% Direct and Indirect Capital Costs)				5,000	-
Total Indirect Capital Costs				2,705 7,705	-
TOTAL CAPITAL COSTS		+		16,229	-
ANNUAL OPERATION AND MAINTENANCE COSTS				10,229	
Inspect and repair signs annually	Event	1 1	8,524	8,524	I CM
Monitor Tissue at 1 Location	Event	1	4,832	4,832	EE
Monitoring Report	Event	1 1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and				The state of the s	
Revaluate Status	Event	1 1	11,202	11,202	EE
				0	
				0	
				0	
				0	
					-
					-
Annual O&M Costs				0 28,158	-
Present Worth Annual O&M Costs (5 years, 5%) - Factor =				20,130	_
4.33				121,924	
Present Worth Annual O&M Costs (25 years, 25% per 5				121,024	
year interval) - Factor = 2.69				75,745	
Contingency (20% of O&M Costs)				39,534	
TOTAL O&M PRESENT WORTH COSTS (30 years)				237,203	
TOTAL PRESENT WORTH COSTS				253,432	
Notes:				250,102	
CM - cost manual	1 111				
EE - engineering estimate					
FD - former design					
D&M - operation and maintenance					
D&M costs distributed annually for years 0 to 5, every 5 years					

Alternative 2	able V-11				
	Kuluk Ba				
101	Kuluk bu	,			
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS		T 07 T	444	12.710	I CM
nstall signs along site perimeter	Sign	97	141	13,718	CIVI
		-			_
					_
		-			
				- ·	-
				10.710	-
Total Direct Capital Costs				13,718	
NDIRECT CAPITAL COSTS	H 26			1000	-
Apply landuse restrictions to Industrial Use Only (No	Site	1	5,000	5,000	EE
Excavation Without Approvals/ Notifications)				130	+
		-			+
		-			+
		-			-
		+			
		_			
		-			
Subtotal Indirect Capital Cost		_		5,000	
Contingency (20% Direct and Indirect Capital Costs)				3,744	
Total Indirect Capital Costs				8,744	
TOTAL CAPITAL COSTS				22,462	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Inspect and repair signs annually	Event	1	2,712	2,712	CM
Monitor Tissue at 5 Locations	Event	1	8,832	8,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and	Event	1	11,202	11,202	EE
Revaluate Status	Event		11,202	11,202	
					+
					_
					_
		_			
Annual O&M Costs				26,346	
Present Worth Annual O&M Costs (5 years, 5%) - Factor =				22,310	
4.33				114,078	
Present Worth Annual O&M Costs (25 years, 25% per 5					
year interval) - Factor = 2.69				70,871	
Contingency (20% of O&M Costs)				36,990	
TOTAL O&M PRESENT WORTH COSTS (30 years)				221,939	
TOTAL PRESENT WORTH COSTS				244,400	
Notes:					
Notes: CM - cost manual					
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance O&M costs distributed annually for years 0 to 5, every 5 year					

Altorno	Table V-12 ative 3 - Conta	ainment			+
	way Landfill	53 53 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			
Tor Cause	way Landilli	(SVVIVIO 2)			+
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS			ART CENTER		100 UN - 110
Install 3 Monitoring Wells	Each	3	2,314	6,942	CM
Import Fill for continuous site cover to minimum thickness of two feet	Cubic yard	2,320	23	54,136	CM
Place continuous site cover to minimum thickness of two feet using imported soils	Cubic yard	2,320	15	34,800	СМ
Establish vegetation	Acre	3.6	6,008	21,628	FD
Total Direct Capital Costs				117,506	
INDIRECT CAPITAL COSTS				117,500	1
Apply landuse restrictions (No Excavation Without Approvals/ Notifications)	Site	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1	7,050	7,050	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	4,700	4,700	EE
Bond, Insurance, Permitting	Lump Sum	1	1,175	1,175	EE
Subtotal Indirect Capital Cost				17,926	-
Contingency (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs				27,086	
TOTAL CAPITAL COSTS				45,012 162,518	-
ANNUAL OPERATION AND MAINTENANCE COSTS				102,516	
Monitor Groundwater at 3 Wells and Sediment at 1					T
Location	Event	1	9,462	9,462	EE
Landfill Monitoring Report	Event	1	4,160	4,160	EE
Inspection and repair of landfill cover& maintain vegetation	Acre	3.6	2,274	8,188	EE
Landfill Inspection/Repair Report Periodic Site Review - Monitoring/ Inspection Results, and	Event	1	4,160	4,160	EE
Revaluate Status	Event	1	11,152	11,152	EE
Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor =				37,122	
4.33 Present Worth Annual O&M Costs (5 years, 5%) - Pactor =				160,738	
year interval) - Factor = 2.69 Contingency (20% of O&M Costs)				99,858	
TOTAL O&M PRESENT WORTH COSTS (30 years)				52,119	
TOTAL PRESENT WORTH COSTS				312,716 475,234	
Notes: CM - cost manual					
EE - engineering estimate					
FD - former design					
D&M - operation and maintenance D&M costs distributed annually for years 0 to 5, every 5 year					

Alterna ⁴	Table V-13 tive 3 - Conta	inment			
for South Davi			4)		
		,			
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS			2.244	0.040	ГСМ
nstall 3 Monitoring Wells	Each	3	2,314	6,942	
mport Fill for continuous site cover to minimum thickness	Cubic yard	2,460	24	58,648	CM
Place continuous site cover to minimum thickness of two		0.400	45	20,000	CM
feet using imported soils	Cubic yard	2,460	15	36,900	СМ
Establish vegetation	Acre	3.8	1,926	7,320	FD
					-
					-
Total Direct Capital Costs				109,810	+
INDIRECT CAPITAL COSTS				100,010	
Apply landuse restrictions (No Excavation Without	Site	1	5,000	5,000	EE
Approvals/ Notifications)	13.115.		·		
Design/Specifications	Lump Sum	1	6,589	6,589	EE
Construction Oversight - Field/Office Engineering	Lump Sum		4,392	4,392 1,098	EE
Bond, Insurance, Permitting	Lump Sum	1	1,098	1,098	
					-
Subtatal Indicast Capital Cost				17,079	-
Subtotal Indirect Capital Cost Contingency (20% Direct and Indirect Capital Costs)				25,378	
Total Indirect Capital Costs				42,457	
TOTAL CAPITAL COSTS				152,267	
ANNUAL OPERATION AND MAINTENANCE COSTS			•		
Monitor Groundwater at 3 Wells and Sediment at 1	Event	1	9,462	9,462	EE
Location					
Landfill Monitoring Report	Event	1	4,160	4,160	EE
Inspection and repair of landfill cover & maintain	Acre	3.8	2,189	8,320	EE
				1.100	EE
vegetation Landfill Inspection/Repair Report	Event	1	4,160	4,160	CC
Landfill Inspection/Repair Report Periodic Site Review - Monitoring/ Inspection Results, and					
Landfill Inspection/Repair Report	Event	1	4,160 11,152	4,160 11,152	EE
Landfill Inspection/Repair Report Periodic Site Review - Monitoring/ Inspection Results, and					
Landfill Inspection/Repair Report Periodic Site Review - Monitoring/ Inspection Results, and					
Landfill Inspection/Repair Report Periodic Site Review - Monitoring/ Inspection Results, and					
Landfill Inspection/Repair Report Periodic Site Review - Monitoring/ Inspection Results, and					
Landfill Inspection/Repair Report Periodic Site Review - Monitoring/ Inspection Results, and					
Landfill Inspection/Repair Report Periodic Site Review - Monitoring/ Inspection Results, and					
Landfill Inspection/Repair Report Periodic Site Review - Monitoring/ Inspection Results, and					
Landfill Inspection/Repair Report Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status				11,152	
Landfill Inspection/Repair Report Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status Annual O&M Costs					
Landfill Inspection/Repair Report Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				11,152	
Landfill Inspection/Repair Report Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5				37,254 161,310	
Landfill Inspection/Repair Report Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				37,254 161,310 100,213	
Landfill Inspection/Repair Report Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs)				37,254 161,310 100,213 52,305	
Annual O&M Costs Persent Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)				37,254 161,310 100,213 52,305 313,828	
Annual O&M Costs Persent Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS				37,254 161,310 100,213 52,305	
Annual O&M Costs Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes:				37,254 161,310 100,213 52,305 313,828	
Landfill Inspection/Repair Report Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS				37,254 161,310 100,213 52,305 313,828	
Annual O&M Costs Persent Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual				37,254 161,310 100,213 52,305 313,828	

1 11/20/75 100	tive 3 - Conta	32/3/2020			
for Finger I	Bay Landfill (SWMU 29)			
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS	Each	3	2,314	6,942	CM
nstall 3 Monitoring Wells mport Fill for continuous site cover to minimum thickness	Each				
of two feet	Cubic yard	3,740	23	85,648	CM
Place continuous site cover to minimum thickness of two	0	2.740	15	56,100	СМ
eet using imported soils	Cubic yard	3,740			
Establish vegetation	Acre	5.8	5,829	33,810	FD
Total Direct Capital Costs				182,500	
INDIRECT CAPITAL COSTS		T			
Apply landuse restrictions (No Excavation Without Approvals/ Notifications)	Site	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1	10,950	10,950	EE
Construction Oversight - Field/Office Engineering	Lump Sum		7,300	7,300	EE
Bond, Insurance, Permitting	Lump Sum	1	1,825	1,825	EE
					-
Subtotal Indirect Capital Cost				25,075	
Contingency (20% Direct and Indirect Capital Costs)				41,515	
Total Indirect Capital Costs TOTAL CAPITAL COSTS				66,590 249,090	
ANNUAL OPERATION AND MAINTENANCE COSTS				249,030	
Monitor Groundwater at 3 Wells and Sediment at 1	T	T			1
Location	Event	1	9,462	9,462	EE
Landfill Monitoring Report	Event	1	4,160	4,160	EE
Inspection and repair of landfill cover& maintain vegetation	Acre	5.8	1,697	9,840	EE
Landfill Inspection/Repair Report	Event	1	9,840	9,840	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,152	11,152	EE
Annual O&M Costs				44,454	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5				192,486	
year interval) - Factor = 2.69				119,581	
Contingency (20% of O&M Costs)				62,413	
TOTAL O&M PRESENT WORTH COSTS (30 years)				374,480	
TOTAL PRESENT WORTH COSTS				623,570	
Notes:					
CM - cost manual					
EE - engineering estimate	-				
FD - former design		-	-		+
O&M - operation and maintenance		1	1		

***	Table V-15	inmart			
	tive 3 - Conta er Building (S		-		
for Old Bai	er Building (SVVIVIO 10)			
			Unit		T
이 아이는 아이는 그들은 사람들이 없었다.	Unit	Quantity	Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS					
mport Fill for continuous site cover to minimum thickness	Outle mand	7.800	21	163,836	СМ
f two feet	Cubic yard	7,800	21	165,656	CIVI
Place continuous site cover to minimum thickness of two	Cubic yard	7,800	15	117,000	СМ
eet using imported soils			, ,		500-3003
Stablish vegetation	Acre	2.4	6,232	14,956	FD
					+
					-
					+
	No. of Control				
					-
				20F 702	+
Total Direct Capital Costs				295,792	
NDIRECT CAPITAL COSTS				5.000	T 55
Apply landuse restrictions (Industrial Site Use Only)	Site	1	5,000	5,000 17,748	EE
Design/Specifications	Lump Sum		17,748 11,832	11,832	EE
Construction Oversight - Field/Office Engineering	Lump Sum		2,958	2,958	EE
Bond, Insurance, Permitting	Lump Sum	-	2,950	2,550	
					_
					1
	-				
Subtotal Indirect Capital Cost				37,537	
Contingency (20% Direct and Indirect Capital Costs)	0			66,666	
Total Indirect Capital Costs				104,203	
TOTAL CAPITAL COSTS				399,995	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Sediment at 2 Locations	Event	1	5,832	5,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and	Event	1	11,202	11,202	EE
Revaluate Status		-			_
		-	-		_
			-		_
		_	-		_
	1				
				20.001	
Annual O&M Costs		-		20,634	-
Present Worth Annual O&M Costs (5 years, 5%) - Factor =				89,345	
4.33		-		69,345	-
Present Worth Annual O&M Costs (25 years, 25% per 5				55,505	
year interval) - Factor = 2.69	-	-		28,970	_
Contingency (20% of O&M Costs)				173,821	_
TOTAL 0&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS				573,816	_
				5.0,010	
Notes:					
CM - cost manual					
EE - engineering estimate FD - former design					
O&M - operation and maintenance					
TOTAL - OPERATOR AND HIGHINGING	ars for years		+		

Alternat	Table V-16 ive 3 - Conta	inment			
	Plant No. 3 (S				
IDI POWEI F	Plant No. 3 (771010 17)			
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
IRECT CAPITAL COSTS		0	14613	29,226	CM
eplace oil.water seperators(OWS) #1 and #2	Each	2	14,613		
oute OWS overflow to sanitary sewer or retention vault	Each	2	12,924	25,848	СМ
aste Oil Pond Dewatering, Temporary Storage, Treatment					
oil/water seperation/solids removal), and Characterization	Gallon	235,000	0.23	53,804	VQ
r Discharge During Construction				0.474	CM
Construct Temporary Sediment Dewatering Cells	Lump Sum	1	9,474	9,474	CM
nport Fill for Waste Oil Pond Sediment Cover - Boulders,	Cubic yard	2,480	25	61,448	CM
cobbles and Soils				ro-sarrorata	
Place continuous site cover to minimum thickness of two	Cubic yard	2,480	15	37,200	СМ
eet using imported soils stablish Vegetation for Waste Oil Pond	Acre	0.15	18,643	2,797	FD
Stabilish Vegetation for VYaste City and					
Fotal Direct Capital Costs				219,797	
NDIRECT CAPITAL COSTS	Each	1	5,000	5,000	EE
Apply landuse restrictions (Industrial Site Use Only) Apply landuse restrictions (No Excavation Without					
Approvals/Notifications)	Each	1	5,000	5,000	EE
Approvais/Notifications) Design/Specifications	Lump Sum	1	13,188	13,188	EE
Construction Oversight - Field/Office Engineering	Lump Sum		8,792	8,792	EE
Bond, Insurance, Permitting	Lump Sum	1	2,198	2,198	EE
Subtotal Indirect Capital Cost				34,178	-
Contingency (20% Direct and Indirect Capital Costs)				50,795	-
Total Indirect Capital Costs				84,972	-
TOTAL CAPITAL COSTS				304,769	
ANNUAL OPERATION AND MAINTENANCE COSTS	_				_
Annually, inspect/repair sediment cover(s) and maintain	Event	1	17,148	17,148	EE
vegetation Monitor Sediment/surfacewater at 3 Locations	Event	1	6,832	6,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and		1	11,202	11,202	EE
Revaluate Status	Event				
Product trench inspection/maintenance	Gallon	12,000	8.30	99,540	VQ
Annual O&M Costs				138,322	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4 33				598,934	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				372,086	
Contingency (20% of O&M Costs)		100		194,204	-
TOTAL O&M PRESENT WORTH COSTS (30 years)				1,165,225	
TOTAL PRESENT WORTH COSTS				1,469,993	
Notes				-	-
CM - cost manual		-			
EE - engineering estimate		+	-		
			1		
FD - former design O&M - operation and maintenance					

ative 3 - Conta		41.07		
		MUZZ		
Julii Disposai	AIGA (SVVII			
Unit	Quantity	Unit Gosts (\$)	Costs (\$)	Source
Gallon	200,000	0.06	12,126	СМ
				EE
				EE
	100	278		EE
Each	100	75	7,488	FD
Each	100	69	6,912	FD
Out in second	220	26	0 162	CM
Cubic yard	320	20	0,102	CIVI
Cubic yard	320	15	4,800	СМ
			425 460	
			135,460	
Thump Com	1	8 129	8 128	T EE
				EE
				EE
Lump out		1,000	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
			14.901	
			180,433	
Event	1 1	7,832	7,832	EE
Event	1		3,600	EE
d Event	1	11,202	11,202	EE
=			22,634	
			98,005	
			60,885	
			31,778	
			190,669	
			371,102	
	Gallon Each Sample Each Each Cubic yard Cubic yard Cubic yard Lump Sum Lump Sum Lump Sum Lump Sum	Gallon 200,000 Each 100 Sample 12 Each 100 Each 100 Each 200 Cubic yard 320 Cubic yard 320 Cubic yard 320 Lump Sum 1 Lump Sum 1	Unit Quantity Gosts (\$)	Unit Quantity Costs (\$) Costs (\$)

Alterna	Table V-18 tive 3 - Conta	inment			
1.455.0	Sweeper Co	215 TH BUTCH FORD			
10	Oweeper Oc				
			Unit		
	Unit	Quantity	Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS			7 - 12 - 13 - 1		
nstall signs along shorelines	Sign	160	138	22,056	CM
Sediment Characterization Analysis	Sample	160	1,460	233,600	EE
Sediment Rate/Characterization Study	Hour	6,000	75	450,000	EE
Sediment Disposal Site/Selection Study	Hour	4,000	75	300,000	EE
Placement of 1-foot thick submarine cap in Sweeper Cove				10.010.101	014
and Sweeper Creek	Cubic yard	690,000	20	13,918,464	СМ
and officepor creak					
					1
					+
					_
					-
				11021100	-
Total Direct Capital Costs				14,924,120	
INDIRECT CAPITAL COSTS		,			
Establish Restricted Subsistence and Commercial	Site	1	5,000	5,000	EE
Fisheries landuse	Oite				1
Design/Specifications	Lump Sum	1	895,447	895,447	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	596,965	596,965	EE
Bond, Insurance, Permitting	Lump Sum	1	149,241	149,241	EE
Subtotal Indirect Capital Cost				1,646,653	
Contingency (20% Direct and Indirect Capital Costs)	-			3,314,155	
Total Indirect Capital Costs	+	1		4,960,808	1
TOTAL CAPITAL COSTS	-		-	19,884,928	
ANNUAL OPERATION AND MAINTENANCE COSTS				13,004,320	
	Event	T 1	2,712	2.712	T EE
Inspect and repair signs		1	7.832	7.832	EE
Monitor Tissue at 4 Locations	Event	_			EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and	Event	1	11,202	11,202	EE
Revaluate Status					-
					17717
Annual O&M Costs				25,346	
Present Worth Annual O&M Costs (5 years, 5%) - Factor =					
4.33				109,748	
Present Worth Annual O&M Costs (25 years, 25% per 5				,00,140	
year interval) - Factor = 2.69			11	68,181	
	_	-	-	35,586	-
Contingency (20% of O&M Costs)		-	-		-
TOTAL O&M PRESENT WORTH COSTS (30 years)				213,515	-
TOTAL PRESENT WORTH COSTS				20,098,443	
Notes:					
CM - cost manual		1,000			
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years	are for waare	G to 30			

Altorn	Table V-19 ative 3 - Conta	nim ma nut			
	THE PARTY OF THE P	N. S.			
tor S	outh Sweeper	Creek			
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS					
Install signs along shorelines	Sign	50	170	8,524	CM
Sediment Characterization Analysis	Sample	20	1,460	29,200	EE
Sediment Rate/Characterization Study	Hour	800	75	60,000	EE
Sediment Disposal Site/Selection Study	Hour	800	75	60,000	EE
Placement of 1-foot thick sediment cap in Sweeper Creek	Cubic yard	7,300	44	323,748	СМ
Total Direct Capital Costs				481,472	
INDIRECT CAPITAL COSTS		the first	Stanf W		
Establish Restricted Subsistence and Commercial Fisheries landuse	Site	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1	28,888	28,888	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	19,259	19,259	EE
Bond, Insurance, Permitting	Lump Sum	1	4,815	4,815	EE
			.,		
Subtotal Indirect Capital Cost	-			57,962	+
Contingency (20% Direct and Indirect Capital Costs)					-
	-			107,887	-
Total Indirect Capital Costs				165,849	
TOTAL CAPITAL COSTS				647,321	
ANNUAL OPERATION AND MAINTENANCE COSTS				#(\$) P	
Inspect and repair signs annually	Event	1	8,524	8,524	CM
Monitor Tissue at 1 Location	Event	1	4.832	4,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
Annual O&M Costs				28,158	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				121,924	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				75,745	
Contingency (20% of O&M Costs)				39,534	
TOTAL O&M PRESENT WORTH COSTS (30 years)					
TOTAL PRESENT WORTH COSTS				237,203 884,524	
Notes:					
CM - cost manual			1 1		
EE - engineering estimate			111		
FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years		. 00			

Altornative	Table V-20 4 - Removal	(Ontion 1)			-
	ler Building (
15. Old Bu	(10)			
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS					
Waste storage area surface soil excavation and hauling to	Cubic yard	600	25	14,724	СМ
barge on Adak Progress/characterization Sampling & Analysis (soils)	Sample	134	193	25,824	EE
Soil Transport from Adak to Seattle via Barge and Seattle					
to Subtitle C Landfill via truck/rail	Ton	960	312	299,520	FD
Soil Disposal at Subtitle C Hazardous Waste Landfill	Ton	960	288	276,480	FD
Import Fill for continuous site cover to minimum thickness of two feet	Cubic yard	7,800	21	163,836	СМ
Place continuous site cover to minimum thickness of two	Cubic yard	7,800	15	117,000	СМ
feet using imported soils					
Establish vegetation	Acre	2.4	6,232	14,956	FD
					-
Total Direct Capital Costs				912,340	
INDIRECT CAPITAL COSTS			1 1 1 1 1 1 1		
A STATE OF THE STA					
					-
					-
					_
					_
Subtotal Indirect Capital Cost				0	
Contingency (20% Direct and Indirect Capital Costs)				182,468	
Total Indirect Capital Costs				182,468	
TOTAL CAPITAL COSTS				1,094,808	
ANNUAL OPERATION AND MAINTENANCE COSTS					
					-
					+
					+
					1
	11				
Annual O&M Costs				0	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				0	
Present Worth Annual O&M Costs (25 years, 25% per 5					
year interval) - Factor = 2.69				0	
Contingency (20% of O&M Costs)				0	
TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS				0	
Notes:				1,094,808	
Notes: CM - cost manual					
EE - engineering estimate					-
FD - former design					-
O&M - operation and maintenance					
Property of the control of the contr	rs for years 6				

Alternative 4					
for Old Bale	er Building (S	SVVMU 10)			
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
RECT CAPITAL COSTS					T 614
aste storage area surface soil excavation and hauling to arge on Adak	Cubic yard	600	25	14,724	CM
rogress/characterization Sampling & Analysis (soils)	Sample	134	193	25,824	EE
oil Transport from Adak to Seattle via Barge and Seattle	Ton	960	312	299,520	FD
Subtitle C Landfill via truck/rail	Ton	960	350	336,000	FD
oil incineration at off island incinerator nport Fill for continuous site cover to minimum thickness					
r two feet lace continuous site cover to minimum thickness of two	Cubic yard	7,800	21	163,836	CM
et using imported soils	Cubic yard	7,800	15	117,000	СМ
stablish vegetation	Acre	2.4	6,232	14,956	FD
otal Direct Capital Costs				971,860	
NDIRECT CAPITAL COSTS		, L			
		-			_
					+
			-		
		-	-	0	+
Subtotal Indirect Capital Cost				194,372	
Contingency (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs			•	194,372	
TOTAL CAPITAL COSTS			•	1,166,232	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Alloca of Elottonian and an analysis and an an					
					_
				-	+
					_
	-	+	+		
				-	
			-	-	-
	_		+	0	_
Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor =		-		-	
4.33				0	
Present Worth Annual O&M Costs (25 years, 25% per 5					
year interval) - Factor = 2.69				0	
Contingency (20% of O&M Costs)				0	
TOTAL O&M PRESENT WORTH COSTS (30 years)				0	_
TOTAL PRESENT WORTH COSTS				1,166,232	-
Notes				-	
CM - cost manual		-			
EE - engineering estimate	-	-		-	
FD - former design	1				
O&M - operation and maintenance O&M costs distributed annually for years 0 to 5, every 5 years	ars for years	6 to 30			
 This alternative assumes off-island transport and incine solvent extraction and thermal desorption. These technical 	ration of con	taminated s	soils. Other tec ffective because	hnologies evaluate of the high mo	ated on-is

Alternative	Table V-22 4 - Remova				+
	Plant No. 3 (+
IOI FOWE		-,,,,,,			
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS	-				_
Replace oil.water seperators(OWS) #1 and #2 Route OWS overflow to sanitary sewer or retention vault	Each	2	14,613	29,226	CM
Route Ovvs overflow to samilary sewer or retention value	Each	2	12,924	25,848	СМ
Waste Oil Pond Dewatering, Temporary Storage,					_
Treatment (oil/water seperation/solids removal), and	Gallon	235,000	0	53,804	VQ
Characterization for Discharge During Construction				C42 SC #-30-90 - 17	
Construct Temporary Sediment Dewatering Cells	Lump Sum	1	9,474	9,474	CM
Waste oil pond sediment excavation and hauling to barge	Cubic yard	3,270	18	59,774	СМ
on Adak		-1-1-			-
Waste Oil Pond Performance-Progress Sampling & Analysis (soil/sediment)	Sample	164	1,308	214,576	EE
Soil Transport from Adak to Seattle via Barge; and from					-
Seattle to Subtitle C Landfill via truck/rail	Ton	5,232	312	1,632,384	FD
Soil Disposal at Subtitle C Hazardous Waste Landfill	Ton	5,232	288	1,506,816	FD
Import Fill for Waste Oil Pond Sediment Cover -	Cubic yard	5,470	21		
Boulders, Cobbles and Soils	Cubic yard	5,470	21	114,836	СМ
Place continuous site cover to minimum thickness of two	Cubic yard	5,470	12	65,640	СМ
feet using imported soils		A 75 C			
Establish Vegetation	Acre	1.7	5,310	9,027	FD
					+
					1
Total Direct Capital Costs				3,721,405	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions (Industrial Site Use Only)	Each	1	5,000	5,000	EE
Apply landuse restrictions (No Excavation Without	Each	1	5,000	5,000	EE
Approvals/Notifications) Design/Specifications	Luman Cum	4	-		
Construction Oversight - Field/Office Engineering	Lump Sum Lump Sum	1	148,856	148,856	EE
Bond, Insurance, Permitting	Lump Sum	1	37,214	37,214	EE
porta, modificacji romining	Lump oum		37,214	37,214	
Subtotal Indirect Capital Cost				196,070	
Contingency (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs				783,495	-
TOTAL CAPITAL COSTS				979,565	
ANNUAL OPERATION AND MAINTENANCE COSTS				4,700,970	
Annually, inspect/repair sediment cover(s) and maintain					
vegetation	Event	1	17,148	17,148	EE
Monitor Sediment/surfacewater at 3 Locations	Event	1	6,832	6,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and	Event	1	11,202		EE
Revaluate Status				11,202	-
Product trench inspection/maintenance	Gallon	12,000	8.30	99,540	VQ
					-
Annual O&M Costs				138,322	
Present Worth Annual O&M Costs (5 years, 5%) - Factor				500	
= 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5				598,934	
resent vvorth Annual O&M Costs (25 years, 25% per 5 resent vvorth Annual O&M Costs (25 years, 25% per 5 resent vvorth Annual O&M Costs (25 years, 25% per 5				372,086	
Contingency (20% of O&M Costs)				194,204	
TOTAL O&M PRESENT WORTH COSTS (30 years)				1,165,225	_
TOTAL PRESENT WORTH COSTS				5,866,195	
Votes ·				5,500,100	
CM - cost manual					
CM - cost manual EE - engineering estimate			900		

Alternative 4	- Removal	Option 2)					
for Power P	lant No. 3 /5	SWMU 17)					
101 FOWEI F	iant ivo. 5 (c	SVVIVIO 11)					
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source		
27200 14791 00775	Onic	quantity	00313 (4)				
RECT CAPITAL COSTS eplace oil water seperators(OWS) #1 and #2	Each	2	14,613	29,226	CM		
bute OWS overflow to sanitary sewer or retention vault				25,848	СМ		
bute OVVS overflow to samitary server of reconstant value	Each	2	12,924	25,040	OW		
aste Oil Pond Dewatering, Temporary Storage,							
reatment (oil/water seperation/solids removal), and	Gallon	235,000	0.23	53,804	VQ		
haracterization for Discharge During Construction			0.17.1	0.474	CM		
onstruct Temporary Sediment Dewatering Cells	Lump Sum	1	9,474	9,474			
nport Fill for Waste Oil Pond Sediment Cover -	Cubic yard	2,480	25	61,448	CM		
oulders, Cobbles and Soils	Acre	0.2	18,643	2,797	FD		
stablish Vegetation for Waste Oil Pond					CM		
/aste oil pond sediment excavation and hauling to	Cubic yard	3,270	18	59,774	СМ		
arge on Adak In-island Solvent Extraction	Ton	5,232	232	1,213,824	FD		
lobilization/demobilization, Assembly of Solvent		1	1,200,000	1,200,000	FD		
xtraction Plant	Event						
/aste residual transport/incineration off-island	Ton	250	662	165,500	FD		
				0			
		-		0			
				0			
				0			
				0			
				0			
otal Direct Capital Costs				2,821,695			
NDIRECT CAPITAL COSTS	The state of the state of	S	s. 1 1 3 1 1 1 1	The latest to the			
Apply landuse restrictions (Industrial Site Use Only)	Each	1	5,000	5,000	EE		
Apply landuse restrictions (No Excavation Without	Each	1	5,000	5,000	EE		
approvals/Notifications)			,		EE		
Design/Specifications	Lump Sum		169,302	169,302 112,868	EE		
Construction Oversight - Field/Office Engineering	Lump Sum		112,868 28,217	28,217	EE		
Bond, Insurance, Permitting	Lump Sun	1 1	20,217	20,211			
		_	1				
Subtotal Indirect Capital Cost	1			320,386			
Contingency (20% Direct and Indirect Capital Costs)				628,416			
Total Indirect Capital Costs				948,803			
TOTAL CAPITAL COSTS				3,770,497			
ANNUAL OPERATION AND MAINTENANCE COSTS				·			
Annually, inspect/repair sediment cover(s) and maintain	Event	1	17,148	17,148	EE		
vegetation				6,832	EE		
Monitor Sediment/surfacewater at 3 Locations	Event	1 1	6,832 3,600	3,600	EE		
Monitoring Report	Event	1	3,600				
Periodic Site Review - Monitoring/ Inspection Results,	Event	1	11,202	11,202	EE		
and Revaluate Status	Gallon	12,000	8.30	99,540	VQ		
Product trench inspection/maintenance	Gallott	12,000	0.00				
					-		
		_				-	
	_			_			
				0			
100110-1-				138,322			
Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor	or			1000			
				598,934			
= 4.33 Present Worth Annual O&M Costs (25 years, 25% per	5						
year interval) - Factor = 2.69				372,086			
Contingency (20% of O&M Costs)				194,204			
TOTAL O&M PRESENT WORTH COSTS (30 years)				1,165,225			
TOTAL PRESENT WORTH COSTS				4,935,722			
Notes							
CM - cost manual					-	-	
EE - engineering estimate					-		
FD - former design				-		1	
ORM operation and maintenance		01 01					
O&M costs distributed annually for years 0 to 5, every 5 *- This alternative assumes on-island treatment using s	years for ye	edrs 6 to 30	non-treated w	actes transporte	d to off-islar	d treatment	/
1*. This alternative assumes on-island treatment using s	olvent extra	ction, with	description a	nd off island incit	peration Th	ese process	
incineration plant. Other technologies evaluated inc	dude on inte	nd thermai					

	Table V-24 4 - Removal	(Option 1)			
for White Alice/Trout			VMU 20)		
101 VVIIILE Alice/ 110dt	Creek Dispo	sai Aica (O	VIIIO 20)		
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS				1782 4 4 54	
Naste Removal System Equipment	Lump Sum	1	20,000	20,000	FD
Mobilization/Demobilization	Edinp Gain				
Drum disposal area surface soil excavation and hauling to	Lump Sum	1	20,000	20,000	CM
parge on Adak	The state of the s			40.444	FF
Progress/characterization Sampling & Analysis (soils)	Sample	53	304	16,114	EE
Dewatering, containment, Treatment, and Discharge of Surface Water	Lump Sum	1	30,522	30,522	СМ
Soil Transport from Adak to Seattle via Barge and Seattle to Subtitle C Landfill via truck/rail	Ton	9	312	2,808	FD
Soil Disposal at Subtitle C Hazardous Waste Landfill	Ton	9	288	2,592	FD
Total Direct Capital Costs				92,036	
INDIRECT CAPITAL COSTS					_
NDIRECT CAPITAL COSTS	Τ	T			T
Subtotal Indirect Capital Cost				0	
Contingency (20% Direct and Indirect Capital Costs)			•	18,407	
Total Indirect Capital Costs				18,407	
TOTAL CAPITAL COSTS			1	110,443	
ANNUAL OPERATION AND MAINTENANCE COSTS					
			-		
			-		
					_
	-		-		_
			-		
		-			
					-
					-
		-			-
			-		-
					_
					1
			-	0	
Annual O&M Costs				0	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				0	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5				0	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				0	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs)				0 0 0	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)				0 0 0	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs)				0 0 0	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)				0 0 0	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS				0 0 0	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes:				0 0 0	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual				0 0 0	

A II Ab	Table V-25	(Ontion 2)			
Alternative for White Alice/Trout	4 - Removal	cal Area (C)	VMU 20)		
for White Alice/Trout	Creek Dispo	sai Area (Sv	VIVIO 20)		-
			Unit		
	Unit	Quantity	Costs (\$)	Costs (\$)	Source
27202 1471910 7077	Oille	- Squarrary	(1)	()	
DIRECT CAPITAL COSTS Vaste Removal System Equipment					
Vaste Removal System Equipment Mobilization/Demobilization	Lump Sum	1	20,000	20,000	FD
Orum disposal area surface soil excavation and hauling to			20,000	20,000	СМ
parge on Adak	Lump Sum	1	20,000	20,000	CIVI
Progress/characterization Sampling & Analysis (soils)	Sample	53	304	16,114	EE
Dewatering, containment, Treatment, and Discharge of	Lump Sum	1	30,522	30,522	СМ
Surface Water	Lump Sum	L.	30,322	50,522	
Soil Transport from Adak to Seattle via Barge and Seattle	Ton	9	312	2,808	FD
o Subtitle C Landfill via truck/rail	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				FD
Soil inceneration at off-island facility	Ton	9	350	3,150	FD
					_
					-
Total Direct Capital Costs				92,594	
INDIRECT CAPITAL COSTS					
MIDINEOT ON THE OUT OF					
					_
	-	-		0	
Subtotal Indirect Capital Cost		-	-	18,519	
Contingency (20% Direct and Indirect Capital Costs)	1			18,519	
Total Indirect Capital Costs		_		111,113	
TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS	1				
ANNUAL OPERATION AND MAINTENANCE COSTS	T				T
			-		_
			-		_
		-	-		
			-	-	
			-	0	
Annual O&M Costs				1	
Present Worth Annual O&M Costs (5 years, 5%) - Factor =				0	
4.33			1	1 -	_
Present Worth Annual O&M Costs (25 years, 25% per 5				0	
year interval) - Factor = 2.69	-			0	
Contingency (20% of O&M Costs)	_	_		0	
TOTAL O&M PRESENT WORTH COSTS (30 years)				111,113	
TOTAL PRESENT WORTH COSTS	-	_		111,113	_
Notes:					
CM - cost manual					
EE - engineering estimate					
FD - former design			-		
O&M - operation and maintenance	ears for years		-		_

Alternative	Table V-26 4 - Removal	(Ontion 1)			
for Lake Leone Dr			1U 27)		
IOI Lake Leone Di	ин Бюроои	7.1104 (2111			
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
PIRECT CAPITAL COSTS	197.113				
ond Dewatering, Sump/Well Installation and Discharge	Gallon	200,000	0.06	12,126	CM
During Drum Removal excavate/extract drums and transport to staging area	Each	100	506	50.648	EE
excavate/extract drums and transport to staging area Characterize drums for disposal/ recycling	Sample	12	1,460	17,524	EE
Overpack drums for shipping	Each	100	278	27,800	EE
Ship drums to Subtitle C hazardous waste landfill (assume	Each	100	75	7,488	FD
Vashington or Oregon) Dispose drums to Subtitle C hazardous waste landfill	Each	100	69	6,912	FD
assume Washington or Oregon) Drum disposal area surface soil excavation and hauling to			59	2,962	СМ
parge on Adak	Cubic yard	50	2.7		
Progress/characterization Sampling & Analysis (soils)	Sample	35	1,087	38,062	EE
Goil Transport from Adak to Seattle via Barge and Seattle of Subtitle C Landfill via truck/rail	Ton	80	312	24,960	FD
Soil Disposal at Subtitle C Hazardous Waste Landfill	Ton	80	288	23,040	FD
mport Fill for drum disposal area	Cubic yard	50	24	1,200	CM
Place continuous site cover to fill excvated area using mported soils	Cubic yard	50	15	750	CM
				213,472	
Total Direct Capital Costs				213,472	
NDIRECT CAPITAL COSTS	Lump Sum	1	12,808	12,808	T EE
Design/Specifications	Lump Sum	-	8,539	8,539	EE
Construction Oversight - Field/Office Engineering Bond, Insurance, Permitting	Lump Sum	_	2,135	2,135	EE
				23,482	+
Subtotal Indirect Capital Cost Contingency (20% Direct and Indirect Capital Costs)				47,391	
Total Indirect Capital Costs				70,873 284,345	+
TOTAL CAPITAL COSTS				264,345	
ANNUAL OPERATION AND MAINTENANCE COSTS					T
Annual O&M Costs					
muungi Viitiiti Viitala	=				
Present Worth Annual O&M Costs (5 years, 5%) - Factor : 4.33					
Present Worth Annual O&M Costs (5 years, 5%) - Factor: 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69					_
Present Worth Annual O&M Costs (5 years, 5%) - Factor: 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs)					
Present Worth Annual O&M Costs (5 years, 5%) - Factor: 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)				284 345	
Present Worth Annual O&M Costs (5 years, 5%) - Factor: 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS				284,345	
Present Worth Annual O&M Costs (5 years, 5%) - Factor: 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes:				284,345	
Present Worth Annual O&M Costs (5 years, 5%) - Factor : 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual				284,345	
Present Worth Annual O&M Costs (5 years, 5%) - Factor: 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes:				284,345	

Alternative	Table V-27 4 - Removal	(Option 2)			
for Lake Leone Dr			1U 27)		
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS	55 T				_
Pond Dewatering, Sump/Well Installation and Discharge	Gallon	200,000	0.06	12,126	CM
During Drum Removal Excavate/extract drums and transport to staging area	Each	100	506	50.648	EE
Characterize drums for disposal/ recycling	Sample	12	1,460	17,524	EE
Overpack drums for shipping	Each	100	278	27,800	EE
Ship drums to Subtitle C hazardous waste landfill (assume	Each	100	75	7,488	FD
Washington or Oregon)	Lacii	100	75	7,400	1,5
Dispose drums to Subtitle C hazardous waste landfill	Each	100	69	6,912	FD
(assume Washington or Oregon)	500,000,000	227.22			
Drum disposal area surface soil excavation and hauling to barge on Adak	Cubic yard	50	59	2,962	CM
Progress/characterization Sampling & Analysis (soils)	Sample	35	1,087	38,062	EE
Soil Transport from Adak to Seattle via Barge and Seattle					FD
o Subtitle C Landfill via truck/rail	Ton	80	312	24,960	FU
Soil inceneration at off-island facility	Ton	80	350	28,000	FD
Import Fill for drum disposal area	Cubic yard	50	24	1,200	CM
Place continuous site cover to fill excvated area using	Cubic yard	50	15	750	CM
imported soils					-
					-
					+
					-
Total Direct Capital Costs				218,432	
INDIRECT CAPITAL COSTS	Same No.				
Design/Specifications	Lump Sum	1	13,106	13,106	EE
Construction Oversight - Field/Office Engineering	Lump Sum	-	8,737	8,737	EE
Bond, Insurance, Permitting	Lump Sum		2,184	2,184	EE
Dona, modranoo, i orimany					
Subtotal Indirect Capital Cost				24,028	
Contingency (20% Direct and Indirect Capital Costs)				48,492	
Total Indirect Capital Costs				72,519	
TOTAL CAPITAL COSTS				290,951	
ANNUAL OPERATION AND MAINTENANCE COSTS					
		-			_
	-				_
					_
	-	-			_
		-			_
	-				+
	-	-			_
Annual O&M Costs		+			+
Present Worth Annual O&M Costs (5 years, 5%) - Factor =	-				+
4.33					
Present Worth Annual O&M Costs (25 years, 25% per 5			-		
year interval) - Factor = 2.69					
Contingency (20% of O&M Costs)					
TOTAL O&M PRESENT WORTH COSTS (30 years)					
TOTAL PRESENT WORTH COSTS				290,951	
Notes:					
CM - cost manual		1			
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance					
		-1			-

Au	Table V-28				-
	4 - Remova				
for	Sweeper Co	ove			-
			1114		
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS					
Install signs along shorelines	Sign	160	138	22,056	CM
Sediment Characterization Analysis	Sample	160	1,460	233,600	EE
Sediment Rate/Characterization Study	Hour	6,000	75	450,000	EE
Sediment Disposal Site/Selection Study	Hour	4,000	75	300,000	EE
Obtain off-shore disposal approvals	Site	1	50,000	50,000	EE
Dredging equipment mobilization/ demobilzation (Hydraulic or Clamshell)	Dredge	3	72,300	216,900	СМ
Dredge marine sediment to a depth of 1-foot in Sweeper Cove - Open water disposal	Cubic yard	740,000	21	15,495,064	СМ
Remove miscellaneous debris from dredge material and dispose - island landfill	Cubic yard	733	15	10,995	СМ
Performance-Progress Sampling & Analysis (marine sediment)	Sample	430	1,850	795,500	EE
Performance- Verification Sampling & Analysis (soil/sediment)	Sample	112	1,243	139,216	EE
Characterization for Disposal (soil/sediment)	Sample	430	1,243	534,490	EE
Total Direct Capital Costs				18,247,821	
INDIRECT CAPITAL COSTS	in in partie	- 100		12=1	-
Establish Restricted Subsistence and Commercial					
Fisheries landuse	Site	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1	1,094,869	1,094,869	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	729,913	729,913	EE
Bond, Insurance, Permitting	Lump Sum	1	182,478	182,478	EE
Subtotal Indirect Capital Cost				2,012,260	
Contingency (20% Direct and Indirect Capital Costs)				4,052,016	
Total Indirect Capital Costs				6,064,277	
TOTAL CAPITAL COSTS				24,312,098	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Inspect and repair signs	Event	1	2,712	2,712	EE
Monitor Tissue at 4 Locations	Event	1	7,832	7,832	EE
Monitoring Report Periodic Site Review - Monitoring/ Inspection Results, and	Event Event	1	3,600 11,202	3,600 11,202	EE
Revaluate Status	Lveiii		11,202	11,202	
			1111111		
				25,346	
Annual O&M Costs					
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33			П	109,748	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				68,181	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs)				68,181 35,586	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)				68,181	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS				68,181 35,586	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS				68,181 35,586 213,515	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual				68,181 35,586 213,515	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5				68,181 35,586 213,515	

	Table V-29 4 - Removal	(Ontion 2)			
	Sweeper Co				
101	oweeper or	746			
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS			100	22.056	CM
nstall signs along shorelines	Sign	160	138	233,600	EE
Sediment Characterization Analysis	Sample	160	1,460 75	450,000	EE
Sediment Rate/Characterization Study	Hour	6,000	75	300,000	EE
Sediment Disposal Site/Selection Study	Hour	4,000			EE
Obtain off-shore disposal approvals	Site	1	50,000	50,000	EE
Oredging equipment mobilization/ demobilzation Hydraulic or Clamshell)	Dredge	3	72,300	216,900	СМ
Dredge marine sediment to a depth of 1-foot in Sweeper Cove - Open water disposal	Cubic yard	740,000	21	15,495,064	СМ
Remove miscellaneous debris from dredge material and dispose - island landfill	Cubic yard	733	15	10,995	СМ
Performance-Progress Sampling & Analysis (marine sediment)	Sample	430	1,850	795,500	EE
Performance- Verification Sampling & Analysis	Sample	112	1,243	139,216	EE
(soil/sediment) Characterization for Disposal (soil/sediment)	Sample	430	1,243	534,490	EE
Mobilization/demobilization, Assembly of Solvent	Event	4	1,200,000	4,800,000	СМ
Extraction Plant	Ton	1,160,320	162	188,435,968	CM
On-island Solvent Extraction	Ton	23,680	350	8,288,000	CM
Off-island incineration Waste residual transport/incineration off-island	Ton	23,680	662	15,676,160	CM
Total Direct Capital Costs				235,447,949	
INDIRECT CAPITAL COSTS					
Establish Restricted Subsistence and Commercial	Site	1	5,000	5.000	EE
Fisheries landuse	teather .		27.22		
Design/Specifications	Lump Sum		14,126,877	14,126,877	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	9,417,918	9,417,918	EE
Bond, Insurance, Permitting	Lump Sum	1	2,354,479	2,354,479	EE
				0	
				0	
				0	
	-			0	
Subtotal Indirect Capital Cost				25,904,274	
Contingency (20% Direct and Indirect Capital Costs)				52,270,445	
Total Indirect Capital Costs				78,174,719	
TOTAL CAPITAL COSTS				313,622,668	
ANNUAL OPERATION AND MAINTENANCE COSTS					
	Event	1 1	2.712	2,712	EE
Inspect and repair signs	Event	1	7,832	7.832	EE
Monitor Tissue at 4 Locations	Event	1	3,600	3,600	EE
Monitoring Report Periodic Site Review - Monitoring/ Inspection Results, and	-	1	11,202	11,202	EE
Revaluate Status		-	-	0	-
		-	-	0	+
		-	-		-
	-			0	+
	-	-		U	-
					+
	-	-			-
			-	-	+
		-			-
	-	-		-	+
			-		-
			-	0	+
		-	-	25,346	-
Annual O&M Costs	-		1	100 710	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				109,748	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5					
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				68,181	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				68,181 35,586	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4 33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2 69 Contingency (20% of O&M Costs)				68,181	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)				68,181 35,586	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS				68,181 35,586 213,515	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes				68,181 35,586 213,515	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes CM - cost manual				68,181 35,586 213,515	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes CM - cost manual EE - engineering estimate				68,181 35,586 213,515	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes CM - cost manual				68,181 35,586 213,515	

Alternation	ve 4 - Remova	(Option 1)			1
	South Sweeper				+
101 0	Journ Owceper	CIGGR			
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS					
Install signs along shorelines	Sign	50	170	8,524	CM
Sediment Characterization Analysis Sediment Rate/Characterization Study	Sample	20 800	1,460 75	29,200 60,000	EE
Sediment Disposal Site/Selection Study	Hour	800	75	60,000	EE
Obtain off-shore disposal approvals	Site	1	50,000	50,000	EE
Dredge sediment to a depth of 1-foot in Sweeper Creek	Cubic yard	7,300	30	221,548	CM
Performance-Progress Sampling & Analysis (marine sediment)	Sample	5	1,850	9,250	EE
Performance- Verification Sampling & Analysis (soil/sediment)	Sample	2	1,243	2,486	EE
Characterization for Disposal (soil/sediment)	Sample	5	1,243	6,215	EE
Dispose of Dredge sediments from Sweeper Creek off shore up to 20 miles	Cubic yard	7,300	21	156,511	СМ
Total Direct Capital Costs				603,734	1
Establish Restricted Subsistence and Commercial Fisheries landuse	Site	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1	36,224	36,224	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	24,149	24,149	EE
Bond, Insurance, Permitting	Lump Sum	1	6,037	6,037	EE
Subtotal Indirect Capital Cost				71,411	
Contingency (20% Direct and Indirect Capital Costs)				135,029	
Total Indirect Capital Costs				206,440	
TOTAL CAPITAL COSTS				810,174	
ANNUAL OPERATION AND MAINTENANCE COSTS					
nspect and repair signs annually	Event	1	8,524	8,524	CM
Monitor Tissue at 1 Location	Event	1	4,832	4,832	EE
Monitoring Report Periodic Site Review - Monitoring/ Inspection Results, and	Event	1	3,600	3,600	EE
Revaluate Status	Event	1	11,202	11,202	EE
Annual O&M Costs				28,158	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 1.33				121,924	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69			1 4	75,745	11
Contingency (20% of O&M Costs)		-		39,534	
TOTAL O&M PRESENT WORTH COSTS (30 years)				237,203	10 1
TOTAL PRESENT WORTH COSTS Notes:				1,047,377	
133.0.01					
CM - cost manual					
133.0.01					

	e 4 - Remova	(Option 2)			
for S	outh Sweeper				1
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Sourc
DIRECT CAPITAL COSTS		Territoria			
Install signs along shorelines	Sign	50	170	8,524	CM
Sediment Characterization Analysis	Sample	20	1,460	29,200	EE
Sediment Rate/Characterization Study	Hour	800	75	60,000	EE
Sediment Disposal Site/Selection Study	Hour	800	75	60,000	EE
Obtain off-shore disposal approvals	Site	1	50,000	50,000	EE
Dredge sediment to a depth of 1-foot in Sweeper Creek	Cubic yard	7,300	30	221,548	CM
Performance-Progress Sampling & Analysis (marine sediment)	Sample	5	1,850	9,250	EE
Performance- Verification Sampling & Analysis (soil/sediment)	Sample	2	1,243	2,486	EE
Characterization for Disposal (soil/sediment)	Sample	5	1,243	6,215	EE
Hauling of excavated dredge material up to 2 miles	Cubic yard	7,300	7.5	54,750	CM
Dispose of Dredge sediments from Sweeper Creek off shore up to 20 miles	Cubic yard	7,300	21	156,511	СМ
Mobilization/demobilization, Assembly of Solvent Extraction Plant	Event	1	1,200,000	1,200,000	СМ
On-island Solvent Extraction	Ton	11,096	232	2,574,272	CM
Off-island incineration	Ton	584	350	204,400	CM
Waste residual transport/incineration off-island	Ton	584	662	386,608	EE
Total Direct Capital Costs				5,023,764	-
INDIRECT CAPITAL COSTS				0,020,704	
Establish Restricted Subsistence and Commercial	T				T
Fisheries landuse	Site	1	5,000	5,000	EE
Design/Specifications Construction Oversight - Field/Office Engineering	Lump Sum	1	301,426	301,426	EE
Bond, Insurance, Permitting	Lump Sum Lump Sum	1	200,951 50,238	200,951 50,238	EE
Subtotal Indirect Capital Cost				557,614	
Contingency (20% Direct and Indirect Capital Costs)				1,116,276	
Total Indirect Capital Costs				1,673,890	
TOTAL CAPITAL COSTS				6,697,654	
ANNUAL OPERATION AND MAINTENANCE COSTS					
nspect and repair signs annually	Event	1	8,524	8,524	CM
Monitor Tissue at 1 Location Monitoring Report	Event	1	4,832	4,832	EE
——————————————————————————————————————	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
Annual O&M Costs				28,158	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				121,924	
Present Worth Annual O&M Costs (25 years, 25% per 5				75,745	
/ear interval) - Factor = 2.69				39,534	
Contingency (20% of O&M Costs)	1			237,203	
Contingency (20% of O&M Costs) FOTAL O&M PRESENT WORTH COSTS (30 years)					
Contingency (20% of O&M Costs)				6,934,857	
Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS				6,934,857	
Contingency (20% of O&M Costs) FOTAL O&M PRESENT WORTH COSTS (30 years) FOTAL PRESENT WORTH COSTS Notes:				6,934,857	
Contingency (20% of O&M Costs) FOTAL O&M PRESENT WORTH COSTS (30 years) FOTAL PRESENT WORTH COSTS Notes: CM - cost manual				6,934,857	

Table V-32 Cost Elements for Remedial Alternatives

Element	Florid State State	Cost		Unit	
No.	Element Description	Type	Unit	Costs (\$)	Source
ite Activities (t	Equipment/Earthwork, Materials)	1 5	I	T 00	CM
2	Fencing, 6-foot chain link, installed Gates, 6-foot chain link, installed	D	Linear Foot Linear Foot	29 57	CM CM
3	Signs (2' x 2'), installed	D	Each	102	CM
4	Signs (2' x 2') and posts, installed	D	Each	129	CM
5	Signs (6' x 6') and posts, installed	D	Each	645	CM
6	Large Tundra Crawler Rental (incl. mob/demob)	D	Month	4,500	CM
8	Oil/Water Seperator, installed	D	each	7,365	CM
10	UXO location/removal (includes, Labor, Materials, Travel, Per Diem, Mob/demob)	D	Acre	1,800,000	NAVY
11	Waste Removal System Equipment Mobilization/Demobilization	D	Lump Sum	20,000	CM
12	Dredging equipment mobilization/ demobilization (Hydraulic or Clamshell)	D	Lump Sum	72,300	CM
13	Relocation of dredging equipment to/ from Barge (Hydraulic or Clamshell)	D	Lump Sum	14400	CM
14	Hydraulic Dredging, Dumped into Scows, Dumped up to 5 miles offshore	D	Cubic yard	18.75	CM
15	Clamshell Dredging, Pumped up to 1,000 feet onshore	D	Cubic yard	18.75	CM
16	Freshwater Cover Placement (Pontoon Dredge)	D	Cubic yard	48	CM
17	Fill/topsoil from borrow area: excavate, load, haul up to 5 miles , place & compact	D	Cubic yard	47	CM
18	Fill/topsoil from borrow area: excavate, load, haul up to 5 miles, place	D	Cubic yard	41	FD
19	Fill/topsoil	D	Cubic yard	20	FD
20	General excavation/hauling up to 5 miles	D	Cubic yard	15	FD
21	General excavation/hauling up to 200 yards	D	Cubic yard	12	FD
22	Soil incineration at off island incinerator	D	Ton	350	FD
23	On-Island Thermal Desorption	D	Ton	295	FD
24	Mobilization/demobilization, Assembly of Thermal Desorption Plant	D	Round Trip	1,500,000	FD
25	On-island Solvent Extraction	D	Ton	232	FD
26	Mobilization/demobilization, Assembly of Solvent Extraction Plant	D	Round Trip	1,200,000	CM
27	Waste residual transport/incineration off-island	D	Ton	662	EE
28	Roadway Demolition (6-inch thick asphalt)	D	Square Foot	1	FD
29	Establish Vegetation	D	Acre	5,310	EE
30	Annual Maintenance of Vegetation	O&M	Acre	660	EE
32	Construct Temporary Sediment Dewatering Cells	D	Lump Sum	3,500	CM
33	Freshwater Cover Placement (Clamshell)	D	Cubic yard	19	CM
34	Marine Cover Placement (Barge-mounted Hydraulic)	D	Cubic yard	18.75	CM
35	Clear and Grub vegetation less than 6-in diam, and remove stumps	D	Acre	4,470	CM
36	Burn Cleared/Grub vegetation	D	Acre	2,250	CM
37	Dewatering waterbody during construction(100 gallons per minute @ 8 hours/day)	D	Gallon	0	VQ
38	Pretreatment of waterbody extract (oil water separation and solids removal)	D	Lump Sum	7,500	VQ
39	Dewatering tank transportation	D	Lump Sum	6,000	VQ
40	Dewatering sump/well (10 linear feet deep, 12-inch diam steel)	D	Lump Sum	323	EE
41 42	Annual fence/sign repair, labor and materials	O&M	Lump Sum	5,000	EE
43	Annual resident seminars/visitor briefings	M&O	Site	2,000	EE
43	Annual landfill cover repair, labor and materials	M&O	Lump Sum	5,000	EE
45	Route OWS overflow to sanitary or retention vault	D	Lump Sum	8,000	CM
46	Initial dewatering of waste oil pond	D D	Lump Sum	5,000	EE
47	Generic Analytical Suite		Each	1,000	EE
48	25-foot, 2-inch diameter PVC Monitoring Well - Installed	D	Each	900	CM
49	Health/Safety Plan & Implemenation PCB Analysis	D	Each	1,000	EE
50	Sediment Characterization Analysis	D	Each	150	EE
30	Gediment Characterization Analysis	1 0	Sample	1,460	EE
ransportation	and Hazardous Material Handling				
51	Transport (Barge) shipping containers from Adak to Seattle	T D	Ton	250	FD
52	Transport (Trucking/rail) shipping containers from Seattle to Subtitle C Landfill	D	Ton	62	FD
53	Disposal at Subtitle C Hazardous Waste Landfill	D	Ton	288	FD
54	Disposal of debris at Adak Landfill	D	Ton	0	FD
55	Drum Overpacking	D	Each	250	EE
56	Drum Extraction and Staging	D	Each	400	EE
57	Drum Characterization for Disposal/Recycling	D	Composite Sample	900	EE
58	Product tank rental (5500-gallon capacity)	0&M	Lump Sum	5,900	EE
59	Product tank transportation	O&M	Lump Sum	21,600	EE
60	Product disposal/recycling (diesel to gasoline range)	O&M	Gallon	0	VQ
61	Equipment/materials barge transport Seattle to Adak or Adak to Seattle	D	Ton	250	1 4
62	Airfare, Seattle to Adak	D	Round trip	1,612	EE
ontractor (Tra	nsportation, Per Diem, and Labor)	1			
63	Per Diem (Adak)	D	Person-Day	50	EE
64	Per Diem (Anchorage)	D	Person-Day Person-Day	200	EE
65	Equipment Operator, medium equipment	D	Day	506	CM
66	Truck Driver, heavy equipment	D		200	7407000
67	Laborer	D	Day Day	445 394	CM
01	The second secon			9-10-11	CM
68	Foreman	D	Day	546	CM

Table V-32 (continued) Cost Elements for Remedial Alternatives

Element		Cost		Unit	
No.	Element Description	Type	Unit	Costs (\$)	Source
ngineering					
70	Field engineer	D	Day	422	CM
71	Annual Field inspection/Repair	O&M	Lump Sum	3,800	EE
72	Health & Safety Monitoring (soil, air)	D	Day	400	EE
73	Performance-Progress Sampling & Analysis (soil/sediment)	D	Sample	1,243	EE
74	Performance-Progress Sampling & Analysis (marine sediment)	D	Sample	1,850	EE
75	Performance- Verification Sampling & Analysis (soil/sediment)	D	Sample	1,243	EE
76	Characterization for Disposal (soil/sediment)	D	Sample	1,243	EE
77	Characterization for Discharge (surfacewater)	D	Sample	1,243	EE
78	Tissue Sampling & Analysis	O&M	Sample	2,438	EE
79	Surface-water Sampling & Analysis	O&M	Sample	1,243	EE
80	Field Kit	D	Day	150	EE
81	Report Production	D	Each	1,000	EE
		i	Lump sum	5,000	EE
82	Implement Land Use Restrictions	Ď	Each	5,000	EE
83	Legal Landuse Restrictions Language and Recording	O&M	Lump Sum	2,500	EE
84	Conduct Site Review (Year 5)	I	Lump Sum	50,000	EE
85	Obtain off-shore disposal approvals	Ď	Hour	75	EE
86	Sediment Rate/Characterization Study	D	Hour	75	EE
87	Sediment Disposal Site/Selection Study			6.240	EE
84	Periodic inspection - Product trench	O&M	Lump Sum		EE
85	Periodic maintenance - Product trench	O&M	Lump Sum	6,000	
86	Project Engineer	D	Day	560	EE
87	Senior Engineer	1	Day	720	EE
IXO Clearance	e Activities(Labor, Equipment, Materials)				
88	Labor - Surface Clearance (Crew)	D	Acre	1,049	RA
89	Materials/ Equipment - Surface Clearance	D	Acre	153	RA
90	Mobilization/demobillization - Surface Clearance	D	Lump Sum	187,400	RA
91	Travel- Surface Clearance (Crew) per 30 days	D	Trip	20,400	RA
92	Per Diem - Surface Clearance (Crew)	D	Day	2,040	RA
93	Labor - Geophysical Survey/Data Managment (Crew)	D	Acre	2,595	RA
94	Material / Equipment - Geophysical Survey/Data Management	D	Acre	328	RA
95	Mobilization/demobillization - Geophysical Survey/Data Management	D	Lump Sum	294,400	RA
96	Travel - Geophysical Survey/Data Managment (Crew) per 30 days	D	Trip	37,600	RA
97	Per Diem - Geophysical Survey/Data Managment (Crew)	D	Day	2,880	RA
98	Labor - UXO Clearance to 1-foot Depth (Crew)	D	Acre	2,382	RA
99	Material / Equipment - UXO Clearance to 1-foot Depth	D	Acre	374	RA
100	Mobilization/demobillization - UXO Clearance to 1-foot Depth	D	Lump Sum	600000	RA
101	Travel- UXO Clearance to 1-foot Depth (Crew) per 30 days	D	Trip	48000	RA
102	Per Diem - UXO Clearance to 1-foot Depth (Crew)	D	Day	3720	RA
102	Labor - UXO Clearance to 4-foot Depth (Crew)	D	Acre	13233.33	RA
	Material / Equipment - UXO Clearance to 4-foot Depth	D	Acre	1744	RA
104		D	Lump Sum	600000	RA
105	Mobilization/demobilization - UXO Clearance to 4-foot Depth	D	Trip	48000	RA
106	Travel - UXO Clearance to 4-foot Depth (Crew) per 30 days	D	Day	3720	RA
107	Per Diem - UXO Clearance to 4-foot Depth (Crew)	D	Acre	1,148,000	RA
108	Labor - UXO Clearance to 10-foot Depth Geophysical Method (Crew)			277.233	RA
109	Material / Equipment - UXO Clearance to 10-foot Depth Geophysical Method	D	Acre	96.5 (1.6.56.10.10.1	RA
110	Mobilization/demobillization - UXO Clearance to 10-foot Depth Geophysical Method	D	Lump Sum	600,000	
111	Travel - UXO Clearance to 10-foot Depth Geophysical Method (Crew) per 30 days	D	Trip	82,000	RA
112	Per Diem - UXO Clearance to 10-foot Depth Geophysical Method (Crew)	D	Day	6,360	RA
112	Labor - UXO Clearance to 10-foot Depth Dig & Screen Method (Crew)	D	Acre	489,000	RA
113	Labor - ONO clearance to 10-100t Depth Dig & corect method (citety)		Acre	287,500	RA
	Material / Equipment - UXO Clearance to 10-foot Depth Dig & Screen Method	D			
113	Material / Equipment - UXO Clearance to 10-foot Depth Dig & Screen Method	D	Lump Sum	600,000	RA
113 114 115	Material / Equipment - UXO Clearance to 10-foot Depth Dig & Screen Method Mobilization/demobillization - UXO Clearance to 10-foot Depth Dig & Screen Method			600,000 115,000	RA RA
113 114 115 116	Material / Equipment - UXO Clearance to 10-foot Depth Dig & Screen Method Mobilization/demobillization - UXO Clearance to 10-foot Depth Dig & Screen Method Travel - UXO Clearance to 10-foot Depth Dig & Screen Method (Crew) per 30 days	D	Lump Sum	CONTRACTOR OF STREET	1000000
113 114 115	Material / Equipment - UXO Clearance to 10-foot Depth Dig & Screen Method Mobilization/demobillization - UXO Clearance to 10-foot Depth Dig & Screen Method	D D	Lump Sum Trip	115,000	RA

Notes	
CM	construction manual ((Means Building Construction Cost Data, 10th Annual Edition, Western Edition, 1997)
EE	engineering estimate
FD	former design
O&M	operation and maintenance
ows	oil/water separator
EOD	estimate from Navy Explosive Ordnance Disposal Detachment, 1/10/97
VQ	vendor quote
RA	actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)

Table V-33 Assumptions for Remedial Alternatives

SITE	ASSUMPTION CATEGORY	DESCRIPTION
Common to one or more FS Sites	inirastructure	-power plant will be operational with power available for remedial activities
ro ones		-existing water supply system operational with water conclude for some dial and different
		-existing water supply system operational with water available for remedial activities -existing water treatment system operational and available for remedial activities (with appropriate
		controls, approvals)
		-existing port and airport facilities open and functional for transport of labor, materials, equipment at no
		additional cost
	Equipment and facilities	-room/board facilities on Adak available in existing structures and with staff (including structures, kitche
		staff, sewer, water, electricity, food, etc.)
		-transportation on Adak for remediation workers and supplies available at no additional cost
		-equipment repair facilities on Adak available with tools, etc.
	1	-all remediation equipment (earthwork, treatment, etc.) imported at cost
	Transport to/ from Adak	Per person on a roundtrip basis from Seattle to Adak via Anchorage (crew rotation every 6 months for
		activities longer than three months)
	Per diem	Greatest activity duration-crew size combination (duration x crew size), assuming remediation workers
		will be conducting multiple tasks while on island
	Engineering design	Includes four design submittals: 6% of total direct costs unless otherwise noted
	Construction oversight	Construction oversight- office/field engineering: 4% of total direct costs unless otherwise noted
	Bond, insurance, permitting	1% of total direct costs
	Contingencies	20% of total indirect and direct costs
	Discount rate on present	5%
	worth analysis	
	Land use restrictions	Includes costs for attorneys, consultants, and expenses/fees to apply for modifications to NAF Adak
		master plan (per site)
	Access restrictions	Includes installation of fences, gates, and/or signs
	Compliance monitoring costs	Includes costs for sampling equipment, field labor, sample analysis (field kit or laboratory), data
		management, and data validation.
		-generic analytical suite: unit costs for sample collection, analysis, and reporting includes four analyses
		for each point of monitoring to cover all COCs (TIN, SVOC, P/A, D/F) or \$250 x 4=\$1,000
	J. M. M. L. I	-field analysis unit cost = 1/4 lab analysis unit cost or \$250
		-sampling of marine dredge unit costs = 1.5 x terrestrial analysis unit costs or \$1,443
		-tissue sample unit costs = 2 x terrestrial analysis unit costs or \$1,850
		-sediment characterization analysis: unit costs for sample collection, analysis, and reporting includes fo
		of five analyses for each point of monitoring to cover (Physical Characteristics, TIN, SVOC, P/A, D/F):
		\$1,460
	Compliance monitoring frequency	-health and safety monitoring (continuous monitoring on a per site basis)
		-performance-progress sample frequency for soil/sediments (1 per 50 cubic yards)
		-performance-verification sample frequency for soil/sediments (1 per 200 cubic vards)
		-characterization for disposal sample frequency for soil/sediments (1 per 500 tons)
		-performance-progress sample frequency for marine sediments (1 per acre)
		-performance-verification sample frequency for marine sediments (1 per 4 acres)
		-characterization for disposal sample frequency for marine sediments (1 per 500 tons)
		-characterization for disposal sample frequency for surface-water (1 per day)
	Sediment density (tons)	Sediment density (drained) assumed to be 1.6 tons per cubic yard
		The second secon
	Soil density (tons)	Soil density assumed to be 1.5 tons per cubic yard
		, and the same transfer of the
	Sediment dewatering cells	Includes grading, berm construction, erosion control, sump construction, dewatering tank rental, design
	construction (temporary)	engineering, and construction oversight
	Vegetation establishment	Includes materials and labor for 1 acre of tundra grass (1 acre per day - 3 person crew)
		, , , , , , , , , , , , , , , , , , , ,
	Soil volume	Soil volumes are in-place calculations
nexploded Ordnance	Educational requirements	One seminar will be conducted for each of the four sites annually
	01	
	Clearing transects for access	Assumptions for clearing transects summarized in cost estimate prepared for the Navy (Dated August 1:
1	restrictions	1997)
11 11 11 11 11 11 11 11 11 11 11 11 11	UXO location and removal	Assumptions for locating and removing UXO summarized in cost estimate prepared for the Navy (Dated
	UXO location and removal	Assumptions for locating and removing UXO summarized in cost estimate prepared for the Navy (Dated August 11, 1997)
		August 11, 1997)
	UXO location and removal	

Table V-33 (continued) Assumptions for Remedial Alternatives

SITE TYPE	ASSUMPTION CATEGORY	DESCRIPTION
Unexploded Ordnance (continued)	Clearing transects for access restrictions	All transects for areas with access control implementation (fence, signs, and gate installation) will be cleared by the Navy EOD Unit. If UXO is present along a proposed transect, alternate locations will be designated by the Navy EOD
	Access restrictions (all UXO sites) quantities	-per FW work plan (2/14/97) w/ assumptions for SA 93 -fences (linear feet): SWMU 1 (18,600'); SWMU 2 (6,000'); SA 93 (11,400') -signs (total)): SWMU 1 (281); SWMU 2 (90); and SA 93 (171) -signs & posts (total)): SWMU 8 (78 - 6' x 6'); and SA 93 (36) -gates (total): SWMU 1 (1 - west gate); SWMU 8 (1 - east gate-sea wall); and SA 93 (1-southeast access road)
	Access restrictions SWMU 2 - minefield	-fence (6,000'); and signs (90)
	Access restrictions SWMU 8 - shoreline	-gate (1 - east gate at sea wall); and signs (39 - 6' x 6') Cost of 6' x 6' sign and posts for SWMU 8 shoreline assumed to be 5 times cost of 2' x 2' sign and posts
Landfills -SWMUs 2,4,29	Cover thickness	Half of existing landfill cover (6.6 acres) to a depth of 2 feet will need replacement
	Cover material	Half of needed fill will be imported from borrow area on Adak, and half of fill will come from on-site (where cover is greater than 2 feet thick)
	Periodic site inspection - Landfill covers	Includes costs for additional 120 cubic yards of borrow material (40 cubic yards per site), trucking, placement, compaction, and 1 week construction oversight
Old Baler Building - SWMU 10	Cover thickness/volume (SWMU 10 only)	Surface soil cover assumed to be 2 feet x 2.4 acres (Alternative 3); excavate and remove 50 ft x 50 ft X 1 foot deep area (Alternative 4 - Options 1 or 2; described below)
	Soil disposal/treatment options	Option 1: off-island transport/disposal of excavated soils; Option 2: Off-island incineration of excavated soils.
Power Plant No.3 - SWMU 17	Dewatering (pond)	Water will be pumped from pond with a centrifugal pump to 18,000-gallon tank with oil/water separation and sediment retention. Four sumps/wells will be installed to complete dewatering of pond. Extracted water will be pumped to sanitary sewer on site.
	Water volume (pond)	Assumed 3 feet of water x 0.14 acres X 2 (dewater and discharge to sewer)
	Oil water separator type	Two concrete vaults with capacity of 40 gallons (300 cubic feet) each
	Pond cover thickness/volume	Subsurface soil cover assumed to be 5 feet x 0.15 acres and excavated sediment (5 feet x 0.15 acres) to be replaced with imported fill (Alternative 3)
	Surface soil/ephemeral sediment cover	Subsurface soil cover assumed to be 2 feet x 1.4 acres and excavated soil (1 foot x 1.4 acres) will be disposed off-island at hazardous waste landfill (Alternative 4 - Options 1 or 2; described below).
	Soil disposal/treatment options	Option 1: off-island transport/disposal; Option 2: On-island treatment (solvent extraction)
	Periodic monitoring	Annual monitoring on Yakutat creek at five locations (samples) for SVOCs, P/A, & TIN
	Periodic site inspection - cover systems	Includes costs for additional 40 cubic yards of borrow material (20 cubic yards per cover), trucking, placement, compaction, and 1 week construction oversight
	Product trench maintenance	Includes 3 portable tanks rented for 1 year to transport product; tank weight of 7200 lbs/tank shipped 24 times per year (r/t); 12,000 gallons per year of product; and composition is diesel (JP-5) to be disposed as a non-hazardous waste off island
Drum Disposal Area - SWMU 20	Sediment thickness & volume	Sediment Cover thickness of DDA assumed to be 1 foot x 0.017 acres (Alternative 3); excavated soil (6 X(4 foot X 4 foot X 1.5 foot area)) will be disposed of off island at hazardous waste landfill (Alternative 4)
	Soil disposal/treatment	Option 1: off-island transport/disposal of excavated soils; Option 2: Off-island incineration of excavated

Table V-33 (continued) Assumptions for Remedial Alternatives

SITE TYPE	ASSUMPTION CATEGORY	DESCRIPTION
Drum Disposal Area - SWMU 27	Drum volume	Drums are completely full of sediments
	Sediment drum density	Sediment density assumed to be 1.6 tons per cubic yard
	Drum contents	Drum contents are hazardous waste and will likely require characterization and disposal off island at a hazardous waste landfill
	Drum overpacking	Includes labor, equipment, materials, and loading of 15 drums per day into shipping containers
	Drum extraction/ staging	Extraction and transportation to staging area of 15 drums per day with an excavator and support truck, establish temporary staging area for containment of drums
	Sediment thickness & volume	Sediment Cover thickness of DDA pond assumed to be 1 foot x 0.2 acres (Alternative 3); excavated soil (1 foot x 0.2 acres) will be disposed of off island at hazardous waste landfill (Alternative 4)
	Soil disposal/treatment options	Option 1: off-island transport/disposal of excavated soils; Option 2: Off-island incineration of excavated soils.
Sweeper Cove	Soil cover volume	1-foot thickness X 430 acres (690,000 cubic yards)
	Dredging volume	1-foot thickness X 460 acres (740,000 cubic yards)
	Duration and number of dredges	Assumes 460 acre-ft (740,000 cubic yards) sediment cover or dredging, 3 dredges would needed (1,050 cubic yards/day) to complete project in approximately 24 months. Excludes time for engineering design, planning & permitting prior to actual field work.
	Dredge material disposal	Open water disposal off-island (up to 20 miles at sea)
	Quantity of debris disposed on island	One-tenth (0.1) percent of 460 acre-ft (740 cubic yards) of debris will be disposed at on island landfill without a disposal fee
	Debris density	Debris density assumed to be 1.6 tons per cubic yard
	Periodic monitoring	Annual monitoring on Sweeper Cove at nine locations(samples) for P/A, and TIN
	Pre-design Sweeper Cove Sediment Study	Sediment characterization, sedimentation rate study, and tidal flow study; siting of off-shore disposal areas
South Sweeper Creek	Soil cover volume	1-foot thickness over 5 acres (7,300 cubic yards)
	Dredging volume	1-foot thickness over 5 acres (7,300 cubic yards)
	Dredge material disposal	Open water disposal off-island (up to 20 miles at sea)
	Periodic monitoring	Annual monitoring on Sweeper Cove at one location (sample) for P/A, and TIN
	Pre-design South Sweeper Creek Sediment Study	Sediment characterization, sedimentation rate study, and tidal flow study; siting of off-shore disposal areas
Kuluk Bay	Periodic monitoring	Annual monitoring in Kuluk Bay at five locations (samples) for P/A, and TIN

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Table V-34 Alternative P1-2 - Clear UXO in Parcel 1

	Unit	Quantity	Unit Cost (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS					
Clear and Destroy UXO	Acre	3,277	4,520 - 4,172,800	\$14.8 Million - 13,670 Million	
Total Direct Capital Costs					
INDIRECT CAPITAL COSTS					
	Site				EE
	Lump Sum				EE
	Lump Sum				EE
	Lump Sum				EE
Subtotal Indirect Capital Cost					
Contingency (20% Direct and In	direct Capital Cos	ts)			
Total Indirect Capital Costs					
TOTAL CAPITAL COSTS					
ANNUAL OPERATION AND M	AINTENANCE C	OSTS			
	Site				EE
	Site				EE
	Site				EE
Project Management					
Subtotal O&M Costs	•				
Contingency (20% of O&M Cos	ts)				
Total Annual O&M Costs					
Present Worth Annual O&M Co	osts (5 years, 5%)	- Factor = 4	1.33		
TOTAL PRESENT WORTH CO				\$14.8 Million	
				to	
				\$13,670	
				Million	

Notes:

CM - cost manual

EE - engineering estimate

FD - former design

O&M - operation and maintenance

125,000 Acres

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Table V-35

Alternative P1-3 - UXO Clearance to 4 Feet at Parcel 1 and Institutional Controls

	Unit	Quantity	Unit Cost (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS	/	/			
Locate and Destroy UXO	~400 acres	1	10,000,000	10.0 Million	Navy
Signs	Signs	688	129	88,752	EE
Total Direct Capital Costs		10.1 Million			
INDIRECT CAPITAL COSTS					
Design (3%)		1		2,700	EE
Construction and Insurance (20%)		1		17,750	EE
Subtotal Indirect Capital Cost				20,450	
Contingency (20% Direct and Indirect	t Capital Cos	ts)		21,840	
Total Indirect Capital Costs				42,290	1111
TOTAL CAPITAL COSTS				10.1 Million	
ANNUAL OPERATION AND MAIN	TENANCE C	OSTS			
Site Inspection	Site	1		6,734	EE
Site Review	Site	1		1,200	EE
Education	Site	1		5,000	EE
Project Management				2,835	
Subtotal O&M Costs				15,769	
Contingency (20% of O&M Costs)				3,150	
Total Annual O&M Costs				18,900	
Present Worth Annual O&M Costs (5 years, 5%)	Factor = 4.	33	82,000	
TOTAL PRESENT WORTH COSTS				\$10.2 Million	

Notes:

CM - cost manual

EE - engineering estimate

FD - former design

O&M - operation and maintenance

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	Unit	Quantity	Unit Cost (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS				1	
	Signs	8,477	129	\$1.1 Million	EE
Total Direct Capital Costs	- 8	,			
INDIRECT CAPITAL COSTS	1 1		T	T	
Design (3%)	Lump Sum	1		32,805	EE
Construction and Insurance (20%)	Lump Sum	1		218,707	EE
Subtotal Indirect Capital Cost				251,512	
Contingency (20% Direct and Indirect	ect Capital Cos	ts)		270,302	
Total Indirect Capital Costs				522,000	
TOTAL CAPITAL COSTS				\$1.6 Million	
ANNUAL OPERATION AND MAIN	NTENANCE C	OSTS		,	
Site Inspection	Site	1		33,670	EE
Site Review	Site	1		3,600	EE
Education	Site	1		15,000	EE
Project Management				8,505	
Subtotal O&M Costs				60,775	
Contingency (20% of O&M Costs)				12,155	
Total Annual O&M Costs				72,930	
Present Worth Annual O&M Costs	(5 years, 5%)	- Factor = 4	4.33	315,787	
TOTAL PRESENT WORTH COST				\$1.9 Million	

Notes:

CM - cost manual

EE - engineering estimate

FD - former design

O&M - operation and maintenance

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Table V-37 Alternative P2-3 - UXO Clearance in Parcels 2, 3, and 5

	Unit	Quantity	Unit Cost (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS					
Clear and Destroy UXO	Acre	73,436	2,260 - 6,371	166.0 Million - 467.8 Million	EE
Total Direct Capital Costs				166.0 Million - 467.8 Million	
INDIRECT CAPITAL COSTS					
Subtotal Indirect Capital Cost					
Contingency (20% Direct and Indire	ect Capital Co	ests)			
Total Indirect Capital Costs					
TOTAL CAPITAL COSTS					
ANNUAL OPERATION AND MAIN	TENANCE (COSTS			
Project Management					
Subtotal O&M Costs					
Contingency (20% of O&M Costs)					
Total Annual O&M Costs					
Present Worth Annual O&M Costs	(5 years, 5%)	- Factor = 4	.33		
TOTAL PRESENT WORTH COSTS				\$166.0 Million to 467.8 Million	

Notes:

CM - cost manual

EE - engineering estimate

FD - former design

O&M - operation and maintenance

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Table V-38 Alternative P2-4 - Surface and Shallow Subsurface UXO Clearance at "Recreational Gateways"

	Unit	Quantity	Unit Cost (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS	-				
Clear and Destroy UXO	Acre	115	2,260 - 6,371	0.3 Million - 0.75 Million	EE
	Signs	2,904	129	0.37 Million	
Total Direct Capital Costs				0.7 Million - 1.1 Million	
INDIRECT CAPITAL COSTS			·· !		
Design (3%)	Lump Sum	1		11,238	EE
Construction and Insurance (20%)	Lump Sum	1		74,923	EE
Subtotal Indirect Capital Cost				86,161	
Contingency (20% Direct and Indire	ect Capital Cos	ts)		91,232	
Total Indirect Capital Costs				177,393	
TOTAL CAPITAL COSTS		, ×		0.8 Million - 1.3 Million	***
ANNUAL OPERATION AND MAIN	NTENANCE CO	OSTS		,	
Site Inspection	Site	1		13,468	EE
Site Review	Site	1		1,200	EE
Education	Site	1		5,000	EE
Project Management				2,835	
Subtotal O&M Costs				22,503	
Contingency (20% of O&M Costs)				4,500	
Total Annual O&M Costs				27,003	
Present Worth Annual O&M Costs		- Factor =	4.33	117,000	
TOTAL PRESENT WORTH COST	S			0.96 Million - 1.4 Million	

Notes:

CM - cost manual

EE - engineering estimate
FD - former design
O&M - operation and maintenance

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Table V-39
Alternative P3-2 - Institutional Controls for Parcel 4

	Unit	Quantity	Unit Cost (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS					
Signs	6 x 6 signs	929	645	599,205	EE
Fencing	Feet	92,903	29	2,694,187	EE
Total Direct Capital Costs	FT			3.3 Million	
INDIRECT CAPITAL COSTS			T	Ι	
Design (3%)	Lump Sum	1		98,802	EE
Construction and Insurance (20%)	Lump Sum	1		658,678	EE
Subtotal Indirect Capital Cost				757,480	
Contingency (20% Direct and Indire	ect Capital Cos	ls)		810,174	
Total Indirect Capital Costs				1,567,654	
TOTAL CAPITAL COSTS				4.9 Million	
ANNUAL OPERATION AND MAIN	TENANCE CO	OSTS			
Site Inspection	Site	1	I	13,468	EE
Site Review	Site	1		1,200	EE
Education	Site	1		5,000	EE
Project Management			1 1 1	2,835	
Subtotal O&M Costs	-			22,503	
Contingency (20% of O&M Costs)				4,500	
Total Annual O&M Costs				27,004	
Present Worth Annual O&M Costs	(5 years, 5%) -	Factor = 4.	33	117,000	
TOTAL PRESENT WORTH COSTS	S			\$5.0 Million	

Notes:

CM - cost manual

EE - engineering estimate

FD - former design

O&M - operation and maintenance

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Table V-40 Alternative P3-3 - UXO Clearance in Parcel 4

	Unit	Quantity	Unit Cost (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS				-	
Locate and Destroy UXO	Acre	1,587	4,520 to 4,172,800	7.2 Million to 6,664 Million	EE
Total Direct Capital Costs				2	
INDIRECT CAPITAL COSTS					
Subtotal Indirect Capital Cost					
Contingency (20% Direct and Indirect	ect Capital Co	osts)			
Total Indirect Capital Costs				1	
TOTAL CAPITAL COSTS					
ANNUAL OPERATION AND MAI	NTENANCE (COSTS			
					4
Project Management					
Subtotal O&M Costs					
Contingency (20% of O&M Costs)					
Total Annual O&M Costs	-				
Present Worth Annual O&M Costs	(5 years, 5%)	- Factor $= 4$.	33		
TOTAL PRESENT WORTH COST	S			7.2 Million to 6,664 Million	

Notes:

CM - cost manual

EE - engineering estimate

FD - former design

O&M - operation and maintenance

Alternative	Table V-41 S2 - Institution	nal Controls			
for Andrew Lake Waste C)	
101 Andrew Lake Waste C	Juliance De	montion ival	ige (Statute 1	/	
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS			The second		
nstall signs at UXO site	Sign	281	102	28,662	CM
nstall fence at UXO site	Linear foot	18,600	29	537,390	CM
mplement access road closures at UXO site	Linear foot	22	57	1,261	СМ
				567 242	
Total Direct Capital Costs				567,313	
INDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency (20% Direct and Indirect Capital Costs)				114,463	
Total Indirect Capital Costs				119,463	
TOTAL CAPITAL COSTS				686,775	
ANNUAL OPERATION AND MAINTENANCE COSTS					_
Annual inspection and repair of fences and signs at UXO site	Event	1	5,000	5,000	EE
Monitor Sediment at 3 Locations	Event	1	4,732	4,732	EE
Monitoring Report	Event	1	3,600	3,600	EE
Review UXO clearance technologies	Event	1	500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Annual O&M Costs				15,832	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33			11 11 11	68,553	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				42,588 22,228	
Contingency (20% of O&M Costs)	+	-			-
TOTAL O&M PRESENT WORTH COSTS (30 years)		-	-	133,369	_
TOTAL PRESENT WORTH COSTS Notes:				820,144	
CM - cost manual					
EE - engineering estimate					
FD - former design					-
O&M - operation and maintenance	1	01.00	-		-
O&M costs distributed annually for years 0 to 5, every 5 years Actual removal action (Adak UXO Clearance Estima	ars for years	aust 11 100	17)		-

Alternative S	Table V-42	nal Controls			
For Causev	vay Minefield	(SWMU 2)			
, at desire	,				
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS				tal . J. co	
nstall fence at SWMU 2 - Minefield	Linear Foot	6,000	29	176,400	CM
nstall Signs at SWMU 2 - Minefield	Sign	90	102	9,180	CM
•					
			4		
					-
Total Direct Capital Costs				185,580	
INDIRECT CAPITAL COSTS		-		5 ma* 2	
Apply landuse restrictions at SWMU 2 - Minefield	Site	1	5,000	5,000	EE
				5,000	-
Subtotal Indirect Capital Cost Contingency (20% Direct and Indirect Capital Costs)				38,116	
Total Indirect Capital Costs				43,116	
TOTAL CAPITAL COSTS				228,696	
ANNUAL OPERATION AND MAINTENANCE COSTS		-			
Annual inspection and repair of fences and signs at SWMU 2- Minefield	Lump Sum	1	5,000	5,000	EE
Review UXO clearance technologies	Lump Sum	0.2	2,500	500	EE
Conduct annual resident seminars	Site	1	2,000	2,000	EE
					_
				7.500	
Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor =				7,500	
4.33 Present Worth Annual O&M Costs (25 years, 25% per 5				32,475	
year interval) - Factor = 2.69				20,175	
Contingency (20% of O&M Costs)				10,530	_
TOTAL O&M PRESENT WORTH COSTS (30 years)				63,180	_
TOTAL PRESENT WORTH COSTS		-	-	291,876	-
Notes:		-			-
CM - cost manual					
EE - engineering estimate FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years	ars for years	6 to 30			
O&M costs distributed annually for years 0 to 5, every 5 years RA- Actual removal action (Adak UXO Clearance Estimate	e, Dated Aug	ust 11, 199	7)		

Alternative	Table V-43 S2 - Institutio	nal Controls			
For Andrew Lake Landfi					
FOI Andrew Lake Landin	ii and Shorei	IIIe (SAAIAIO	o Shoreline)		
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS					
nstall signs at SWMU 8- Shoreline	Sign	78	645	50,310	CM
mplement access road closures SWMU 8- Shoreline	Linear foot	60	64	3,846	CM
Total Direct Capital Costs				54,156	
NDIRECT CAPITAL COSTS					
Apply landuse restrictions at SWMU 8 Shoreline- Danger					
UXO	Site	1 1	5,000	5,000	EE
3,0					1
	-				1
			-		+
					+
					+
					+
Subtatal Indicat Capital Cost				5,000	+
Subtotal Indirect Capital Cost				11,831	+
Contingency (20% Direct and Indirect Capital Costs)	-	-			+
Total Indirect Capital Costs	-	-		16,831	-
TOTAL CAPITAL COSTS				70,987	
ANNUAL OPERATION AND MAINTENANCE COSTS	т				
Annual inspection and repair of fences and signs at	Event	1	5,000	5,000	EE
SWMU 8- Shoreline	-		1000	500	
Review UXO clearance technologies	Event	0.2	2,500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
		-			
					-
					-
					-
					-
					-
Annual O&M Costs				7,500	-
Present Worth Annual O&M Costs (5 years, 5%) - Factor					
= 4.33				32,475	-
Present Worth Annual O&M Costs (25 years, 25% per 5					
				20,175	
year interval) - Factor = 2.69		1		10,530	-
year interval) - Factor = 2.69 Contingency (20% of O&M Costs)					
year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)				63,180	
year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)				63,180 134,167	
year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes:					
year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS					
year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes:					
year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual EE - engineering estimate					
year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual					

Alternative	S2 - Institutio	onal Controls	3		
For Mort	ar Impact Are	ea (SA 93)			
			Unit		
	Unit	Quantity	Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS	14 (6), 14			· · · · · · · · · · · · · · · · · · ·	_
Install signs at UXO site	Sign	171	568	97,152	CM
Install Fencing at UXO site	Liner foot	11,400	29	326,610	CM
Implement access road closures at UXO site	Liner foot	30	64	1,923	CM
					-
					-
					_
Total Direct Capital Costs				425.685	
NDIRECT CAPITAL COSTS			277 757	423,003	
Apply landuse restrictions at UXO site (Military Reserve	Site	1	5,000	5,000	EE
Only)					
					-
Subtotal Indirect Capital Cost				5,000	
Contingency (20% Direct and Indirect Capital Costs)				86,137	
Total Indirect Capital Costs				91,137	
TOTAL CAPITAL COSTS				516,822	
ANNUAL OPERATION AND MAINTENANCE COSTS				`	
Monitor Sediment at 2 Locations	Event	1	4,432	4,432	EE
Monitoring Report Annual inspection and repair of fences and signs at UXO	Event Event	1.0	3,600	3,600	EE
site Review UXO clearance technologies	Event	0.2	5,000 2.500	5,000	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
				2,000	
Appual COM Costs				12-2-3	
Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor				15,532	
2 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5				67,254	
ear interval) - Factor = 2.69				41,781	
Contingency (20% of O&M Costs)				21,807	
OTAL O&M PRESENT WORTH COSTS (30 years) OTAL PRESENT WORTH COSTS				130,842	
lotes:				647,664	
CM - cost manual					
E - engineering estimate					
D - former design					
D&M - operation and maintenance					
D&M costs distributed annually for years 0 to 5, every 5 years					

Alterna	ative S3 - Re	emoval			
for Andrew Lake Waste C	rdnance Dei	molition Ran	nge (SWMU 1)	
	Surface Cle				
			Unit		1120
그렇다 함께 다른 사회가 무슨 물 그리다면서 다양했다.	Unit	Quantity	Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS					
nstall signs at UXO site	Sign	281	102	28,662	СМ
nstall fence at UXO site	Linear foot	18,600	29	537,390	СМ
mplement access road closures at UXO site	Linear foot	22	57	1,261	CM
abor, Materials and Equipment for 3-foot spacing of				AND ADDRESS ASSESSED.	VQ
explosives per 1800-ft leg	Leg (1800 ft)	42,000	1,549	65,058,000	VQ
Confirmation Application - Labor, Materials and Equipment for 3-foot spacing of explosives per 1800-ft leg	Leg (1800 ft)	42,000	1,549	65,058,000	VQ
Accessory Kit for Initiating Line Charge per 1800 ft leg	Leg (1800 ft)	42,000	32	1,351,980	VQ
Confirmation Application - Accessory Kit for Initiating Line	Leg (1800 ft)	42,000	32	1,351,980	VQ
Charge Per 1800 ft leg Restablish Native Flora (Hydroseeding) for Explosive	Acre	70	10.890	762,300	FD
Breaching Areas			000	000 400	DA
abor - Surface Clearance (Crew)	Acre	890	966	860,180	RA
Materials/ Equipment - Surface Clearance	Acre	890	141	125,460	RA
Mobilization/demobillization - Surface Clearance	Lump Sum		187,400	187,400	RA
Travel- Surface Clearance (Crew) per 30 days	Trip	3	20,400	61,200	RA
Per Diem - Surface Clearance (Crew)	Day	74	2,040	150,960	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event	4	3,825	15,300	EE
Contingency - 100% Direct Capital Costs Associated with					
UXO Removal Action				1,400,500	
Total Direct Capital Costs				136,950,573	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at UXO site (Military Reserve	Site	1	5,000	5,000	EE
Only)					
				£ 000	
Subtotal Indirect Capital Cost		-		5,000	-
Contingency - (20% Direct and Indirect Capital Costs)		_		27,391,115	-
Total Indirect Capital Costs				27,396,115	
TOTAL CAPITAL COSTS				164,346,687	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual inspection and repair of fences and signs at UXO	Event	1	5,000	5,000	EE
site Monitor Sediment at 3 Locations	Event	1	4,732	4.732	EE
	Event	1	3,600	3,600	EE
Monitoring Report Review UXO clearance technologies	Event	1	500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Conduct annual resident seminars	Lvein		2,000	2,000	
Annual O&M Costs				15,832	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				68,553	
Present Worth Annual O&M Costs (25 years, 25% per 5				42,588	
year interval) - Factor = 2.69		-		22,228	+
Contingency (20% of O&M Costs)				133,369 164,480,056	-
Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)				104,400,036	-
Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS		+			
Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes:					+
Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual					
Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual EE - engineering estimate					
Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual EE - engineering estimate FD - former design					
Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual EE - engineering estimate FD - former design O&M - operation and maintenance					
Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual EE - engineering estimate FD - former design					

	V-45 (contin				
for Andrew Lake Waste O	ative S3 - Re	molition Day	nge (SWMII 1)	
	1:1-foot Clea		ige (Craino I	/	
Ориог	. I-loot Glea	, arree			
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
RECT CAPITAL COSTS			100	28.662	CM
stall signs at UXO site	Sign	281	102 29	537.390	CM
stall fence at UXO site	Linear foot	18,600 22	57	1,261	CM
nplement access road closures at UXO site	Linear foot	22			
abor, Materials and Equipment for 3-foot spacing of xplosives per 1800-ft leg	Leg (1800 ft)	42,000	1,549	65,058,000	VQ
onfirmation Application - Labor, Materials and quipment for 3-foot spacing of explosives per 1800-ft leg	Leg (1800 ft)	42,000	1,549	65,058,000	VQ
ccessory Kit for Initiating Line Charge per 1800 ft leg	Leg (1800 ft)	42,000	32	1,351,980	VQ
confirmation Application - Accessory Kit for Initiating Line charge Per 1800 ft leg	Leg (1800 ft)	42,000	32	1,351,980	VQ
lestablish Native Flora (Hydroseeding) for Explosive treaching Areas	Acre	70	10,890	762,300	FD
abor - Surface Clearance (Crew)	Acre	890	966	860,180	RA
Materials/ Equipment - Surface Clearance	Acre	890	141	125,460	RA
hobilization/demobillization - Surface Clearance	Lump Sum		187,400	187,400	RA
ravel- Surface Clearance (Crew) per 30 days	Trip	3	20,400	61,200	RA
er Diem - Surface Clearance (Crew)	Day	74	2,040	150,960	RA
abor - Geophysical Survey/Data Managment (Crew)	Acre	730	2,595	1,894,350	RA
faterial / Equipment - Geophysical Survey/Data fanagement	Acre	730	328	239,440	RA
Mobilization/demobilization - Geophysical Survey/Data Management	Lump Sum	1	294,400	294,400	RA
ravel - Geophysical Survey/Data Managment (Crew) per 10 days	Trip	3	37,600	112,800	RA
Per Diem - Geophysical Survey/Data Managment (Crew)	Day	91	2.880	262,080	RA
abor - UXO Clearance to 1-foot Depth (Crew)	Acre	730	2 382	1 738,860	RA
Material / Equipment - UXO Clearance to 1-foot Depth Mobilization/demobilization - UXO Clearance to 1-foot	Acre Lump Sum	730	374 144 000	273.020 144.000	RA RA
Depth Fravel- UXO Clearance to 1-foot Depth (Crew) per 30	Trip	3	101 680	305,040	RA
days	Day	74	3 720	275 280	RA
Per Diem - UXO Clearance to 1-foot Depth (Crew) Detonation of Cleared Explosives & Post Detonation	Event	8	3,825	30,600	EE
Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Contingency - 100% Direct Capital Costs Associated with		-	0,020		
UXO Removal Action Total Direct Capital Costs				6,955,070 148,059,713	
NDIRECT CAPITAL COSTS					
Apply landuse restrictions at UXO site (Military Reserve Only)	Site	1	5,000	5.000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency - (20% Direct and Indirect Capital Costs)				29,612,943	
Total Indirect Capital Costs				29,617,943	
TOTAL CAPITAL COSTS				177,677,655	
ANNUAL OPERATION AND MAINTENANCE COSTS				,	
Annual inspection and repair of fences and signs at UXC site	Lioni	1	5,000	5,000	EE
Monitor Sediment at 3 Locations	Event	1	4,732	4,732 3,600	EE
Monitoring Report	Event	1	3,600 500	500	EE
Review UXO clearance technologies	Event		2,000	2,000	EE
Conduct annual resident seminars	Event	1	2,000	2,000	
Annual O&M Costs				15,832	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33		-	-	68,553	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				42,588	
		_	-	22,228	+
Contingency (20% of O&M Costs)				133,369 177,811,024	
TOTAL O&M PRESENT WORTH COSTS (30 years)					
TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes. CM - cost manual					
TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes. CM - cost manual EE - engineering estimate					
TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes. CM - cost manual EE - engineering estimate FD - former design					
TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes. CM - cost manual EE - engineering estimate		am 6 to 22			

	e V-45 (continuative S3 - Re				
for Andrew Lake Waste C			nge (SWMI))	
	n: 4-feet Clea		ige (SVVMU	1	
Орко	1. 4-leet Olea	ilanice			
			Unit		-
	Unit	Quantity	Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS					
nstall signs at UXO site	Sign	281 18,600	102 29	28,662 537,390	CM
nstall fence at UXO site	Linear foot	22	57	1,261	CM
mplement access road closures at UXO site abor, Materials and Equipment for 3-foot spacing of					
explosives per 1800-ft leg	Leg (1800 ft)	42,000	1,549	65,058,000	VQ
Confirmation Application - Labor, Materials and					
Equipment for 3-foot spacing of explosives per 1800-ft leg			1,549	65,058,000	VQ
Accessory Kit for Initiating Line Charge per 1800 ft leg	Leg (1800 ft)	42,000	32	1,351,980	VQ
Confirmation Application - Accessory Kit for Initiating Line Charge Per 1800 ft leg	Leg (1800 ft)	42,000	32	1,351,980	VQ
Restablish Native Flora (Hydroseeding) for Explosive	Acre	70	10,890	762,300	FD
Breaching Areas Labor - Surface Clearance (Crew)	Acre	890	966	860,180	RA
	Acre	890	141	125,460	RA
Materials/ Equipment - Surface Clearance	Lump Sum	1	187,400	187,400	RA
Mobilization/demobilization - Surface Clearance	Trip	3	20,400	61,200	RA
Travel- Surface Clearance (Crew) per 30 days	Day	74	2,040	150,960	RA
Per Diem - Surface Clearance (Crew)	Acre	730	2,595	1,894,350	RA
abor - Geophysical Survey/Data Managment (Crew) Material / Equipment - Geophysical Survey/Data					
Management	Acre	730	328	239,440	RA
Mobilization/demobillization - Geophysical Survey/Data Management	Lump Sum	1	294,400	294,400	RA
Travel - Geophysical Survey/Data Managment (Crew) per 30 days	Trip	3	37,600	112,800	RA
Per Diem - Geophysical Survey/Data Managment (Crew)	Day	91	2,880	262,080	RA
Labor - UXO Clearance to 4-foot Depth (Crew)	Acre	730	13,233	9,660,331	RA
Material / Equipment - UXO Clearance to 4-foot Depth	Acre	730	1,744	1,273,120	RA
Mobilization/demobilization - UXO Clearance to 4-foot Depth	Lump Sum	1	600,000	600,000	RA
Travel - UXO Clearance to 4-foot Depth (Crew) per 30	Trip	15	48,000	720,000	RA
days	Day	410	3,720	1,525,200	RA
Per Diem - UXO Clearance to 4-foot Depth (Crew) Detonation of Cleared Explosives & Post Detonation					
Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event	12	3,825	45,900	EE
Contingency - 100% Direct Capital Costs Associated with					
UXO Removal Action				18,012,821	
Total Direct Capital Costs				170,175,214	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at UXO site (Military Reserve Only)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost		-		5,000	
Contingency - (20% Direct and Indirect Capital Costs)	-	-		34,036,043	
Total Indirect Capital Costs	+	1		34,041,043	_
TOTAL CAPITAL COSTS	+			204,216,257	
ANNUAL OPERATION AND MAINTENANCE COSTS				204,210,207	
Annual inspection and repair of fences and signs at UXO	-		5 000	5.000	T ==
site	Event	1	5,000	5,000	EE
Monitor Sediment at 3 Locations	Event	1	4,732	4,732	EE
Monitoring Report	Event	1	3,600	3,600	EE
Review UXO clearance technologies	Event	1	500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Annual O&M Costs				15,832	
Present Worth Annual O&M Costs (5 years, 5%) - Factor					
= 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5	+	-		68,553	-
year interval) - Factor = 2.69				42,588	
				22,228	
Contingency (20% of O&M Costs)				133,369	
				204,349,626	
Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS					
TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS					
TOTAL O&M PRESENT WORTH COSTS (30 years)					
TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes:					
TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual					
TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual EE - engineering estimate FD - former design					
TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual EE - engineering estimate					

		nued)			
	ative S3 - Re		1011111111		
for Andrew Lake Waste C			nge (SWMU 1)	
Option	10-feet Cle	arance			
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS		Ar regular		HALLEY TAYLOR	
nstall signs at UXO site	Sign	281	102	28,662	CM
nstall fence at UXO site	Linear foot	18,600	29	537,390	CM
mplement access road closures at UXO site	Linear foot	22	57	1,261	CM
abor, Materials and Equipment for 3-foot spacing of					140
explosives per 1800-ft leg	Leg (1800 ft)	42,000	1,549	65,058,000	VQ
Confirmation Application - Labor, Materials and Equipment					
	Leg (1800 ft)	42,000	1,549	65,058,000	VQ
Accessory Kit for Initiating Line Charge per 1800 ft leg	Leg (1800 ft)	42,000	32	1,351,980	VQ
Confirmation Application - Accessory Kit for Initiating Line					
Charge Per 1800 ft leg	Leg (1800 ft)	42,000	32	1,351,980	VQ
Restablish Native Flora (Hydroseeding) for Explosive	101				-
Breaching Areas	Acre	70	10,890	762,300	FD
abor - Surface Clearance (Crew)	Acre	890	966	860,180	RA
Materials/ Equipment - Surface Clearance	Acre	890	141	125,460	RA
	Lump Sum	1	187,400	187,400	RA
Mobilization/demobilization - Surface Clearance		3	20,400	61,200	RA
ravel- Surface Clearance (Crew) per 30 days	Trip				RA
Per Diem - Surface Clearance (Crew)	Day	74	2,040	150,960	
abor - Geophysical Survey/Data Managment (Crew)	Acre	640	2,595	1,661,345	RA
Material / Equipment - Geophysical Survey/Data	Acre	640	328	209,989	RA
Management		7.17			0,000,00
Mobilization/demobillization - Geophysical Survey/Data	Lump Sum	1	294,400	294.400	RA
Management	Lump Ouri		201,400	201,400	
Fravel - Geophysical Survey/Data Managment (Crew) per	Trin	3	37.600	112,800	RA
30 days	Trip	3	37,000	112,000	IVA
Per Diem - Geophysical Survey/Data Managment (Crew)	-	0.	0.000	202 222	D4
(o.o.)	Day	91	2,880	262,080	RA
abor - UXO Clearance to 10-foot Depth Dig & Screen	(9)				
Method (Crew)	Acre	640	489,000	312,960,000	RA
Mobilization/demobillization - UXO Clearance to 1-foot					-
	Lump Sum	1	144,000	144,000	RA
Depth					
Mobilization/demobillization - UXO Clearance to 10-foot	Lump Sum	1	600,000	600,000	RA
Depth Dig & Screen Method	-				
Travel - UXO Clearance to 10-foot Depth Dig & Screen	Trip	195	147,436	28,750,000	RA
Method (Crew) per 30 days	22762	3.8.3	1331343		9.5.5
Per Diem - UXO Clearance to 10-foot Depth Dig & Screen	Day	5.815	8.880	51,637,200	RA
Method (Crew)	Day	0,010	0,000	01,007,200	101
Detonation of Cleared Explosives & Post Detonation					
Sampling per 50 Acres Cleared (Labor, Analysis.	Event	17	3,825	65,025	EE
Materials)					
Contingency - 100% Direct Capital Costs Associated with					
UXO Removal Action		1		398,082,039	
				930,313,650	
Total Direct Capital Costs		1		500,010,000	
Total Direct Capital Costs					
NDIRECT CAPITAL COSTS					
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve	Site	1	5,000	5,000	EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve	Site	1	5,000	5,000	EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve	Site	1	5,000	5,000	EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve	Site	1	5,000	5,000	EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve	Site	1	5,000	5,000	EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve	Site	1	5,000		EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only)	Site	1	5,000	5,000	EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost	Site	1	5,000		EE
	Site	1	5,000	5,000	EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs	Site	1	5,000	5,000 186,063,730 186,068,730	EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS	Site	1	5,000	5,000 186,063,730	EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS				5,000 186,063,730 186,068,730 1,116,382,380	
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO	Site	1	5,000	5,000 186,063,730 186,068,730	EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL INSpection and repair of fences and signs at UXO site	Event	1	5,000	5,000 186,063,730 186,068,730 1,116,382,380 5,000	EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations	Event Event	1 1	5,000 4,732	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732	EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitoring Report	Event Event Event	1 1 1	5,000 4,732 3,600	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600	EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitoring Report Review UXO clearance technologies	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500	EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Fotal Indirect Capital Costs FOTAL CAPITAL COSTS INNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitoring Report Review UXO clearance technologies	Event Event Event	1 1 1	5,000 4,732 3,600	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600	EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Fotal Indirect Capital Costs FOTAL CAPITAL COSTS INNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitoring Report Review UXO clearance technologies	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500	EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Fotal Indirect Capital Costs FOTAL CAPITAL COSTS INNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitoring Report Review UXO clearance technologies	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500	EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Fotal Indirect Capital Costs FOTAL CAPITAL COSTS INNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitoring Report Review UXO clearance technologies	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500	EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitoring Report Review UXO clearance technologies	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500	EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Fotal Indirect Capital Costs FOTAL CAPITAL COSTS INNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitoring Report Review UXO clearance technologies	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500	EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Fotal Indirect Capital Costs FOTAL CAPITAL COSTS INNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitoring Report Review UXO clearance technologies	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500	EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitoring Report Review UXO clearance technologies Conduct annual resident seminars	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500	EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Dnly) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO site Monitors ediment at 3 Locations Monitorn Report Review UXO clearance technologies Conduct annual resident seminars	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500 2,000	EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION SITE OF STATE OF S	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500 2,000	EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Donly) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitoring Report Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500 2,000	EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Dnly) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitoring Report Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500 2,000	EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Wontor Sediment at 3 Locations Monitoring Report Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500 2,000 15,832 68,553 42,588	EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Dnly) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs Total Indirect Capital Costs TOTAL CAPITAL COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitoring Report Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 years interval) - Factor = 2.69 Contingency (20% of O&M Costs)	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500 2,000 15,832 68,553 42,588 22,228	EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Dnly) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS Lannual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitoring Report Review UXO clearance technologies Conduct annual resident seminars Annual inspection and Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4 33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500 2,000 15,832 68,553 42,588 22,228 133,369	EE EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Dnly) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs Total CAPITAL COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitor Sediment at 3 Locations Conduct annual resident seminars Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4 x33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2 x69 Contingency (20% of O&M Costs) Total O&M PRESENT WORTH COSTS (30 years)	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500 2,000 15,832 68,553 42,588 22,228	EE EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Dnly) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO site Monitoring Report Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500 2,000 15,832 68,553 42,588 22,228 133,369	EE EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitoring Report Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500 2,000 15,832 68,553 42,588 22,228 133,369	EE EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Dnly) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs Total CAPITAL COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitoring Report Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes:	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500 2,000 15,832 68,553 42,588 22,228 133,369	EE EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Donly) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Fotal Indirect Capital Costs FOTAL CAPITAL COSTS INNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitorn Sediment at 3 Locations Monitorn Report Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) FOTAL O&M PRESENT WORTH COSTS (30 years) FOTAL PRESENT WORTH COSTS Notes CM - cost manual EE - engineering estimate	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500 2,000 15,832 68,553 42,588 22,228 133,369	EE EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Only) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO site Monitor sediment at 3 Locations Monitoring Report Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes CM - cost manual EE - engineering estimate FD - former design	Event Event Event Event	1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500 2,000 15,832 68,553 42,588 22,228 133,369	EE EE EE EE
NDIRECT CAPITAL COSTS Apply landuse restrictions at UXO site (Military Reserve Donly) Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Fotal Indirect Capital Costs FOTAL CAPITAL COSTS INNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at UXO site Monitor Sediment at 3 Locations Monitorn Sediment at 3 Locations Monitorn Report Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) FOTAL O&M PRESENT WORTH COSTS (30 years) FOTAL PRESENT WORTH COSTS Notes CM - cost manual EE - engineering estimate	Event Event Event Event	1 1 1 1 1 1 1 1	5,000 4,732 3,600 500	5,000 186,063,730 186,068,730 1,116,382,380 5,000 4,732 3,600 500 2,000 15,832 68,553 42,588 22,228 133,369	EE EE EE EE

Altae	Table V-46				-
	native S3 - Re				-
	way Minefield				
0	ption: All Dep	ths			
			linit		-
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS	III.	0.000	00	170 100	
Install fence at SWMU 2 - Minefield Install Signs at SWMU 2 - Minefield	Linear Foot	6,000	29	176,400	CM
install olgris at 500 MO 2 - Minerield	Sign	90	102	9,180	СМ
Labor, Materials and Equipment for 3-foot spacing of explosives per 1800-ft leg	Leg (1800 ft)	27,000	1,549	41,823,000	VQ
Confirmation Application - Labor, Materials and Equipment for 3-foot spacing of explosives per 1800-ft leg	Leg (1800 ft)	27,000	1,549	41,823,000	VQ
Accessory Kit for Initiating Line Charge per 1800 ft leg	Leg (1800 ft)	27,000	32	869,130	VQ
Confirmation Application- Accessory Kit for Initiating Line Charge per 1800 ft leg	Leg (1800 ft)	27,000	32	869,130	VQ
Restablish Native Flora (Hydroseeding) for Explosive Breaching Areas	Acre	45	10,890	490,050	FD
Materials/ Equipment - Surface Clearance	Acre	45	153	6,885	EE
Mobilization/demobillization - Surface Clearance	Lump Sum	0.5	187,400	93,700	EE
Travel- Surface Clearance (Crew) per 30 days	Trip	1	8,160	8,160	EE
Per Diem - Surface Clearance (Crew)	Day	4	9,400	37,600	EE
Continuous 1009/ Direct Contal Costs Associated with					
Contingency - 100% Direct Capital Costs Associated with UXO Removal Action				146,345	
Total Direct Capital Costs				86 352,580	
NDIRECT CAPITAL COSTS					
Apply landuse restrictions at SWMU 2 - Minefield	Site	1	5.000	5,000	EE
			-		
Subtotal Indirect Capital Cost				F 000	
Contingency - (20% Direct and Indirect Capital Costs)				5,000	
Total Indirect Capital Costs				17,271,516	
TOTAL CAPITAL COSTS				17,276,516	
ANNUAL OPERATION AND MAINTENANCE COSTS				103,629,096	
Annual inspection and repair of fences and signs at SWMU					
2- Minefield	Lump Sum	1	5,000	5,000	EE
Review UXO clearance technologies	Lump Sum	0.2	2,500	500	EE
Conduct annual resident seminars	Site	1	2,000	2.000	EE
			2,000	2,000	
				7,500	
Annual O&M Costs				7,000	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 1.33				32,475	
Present Worth Annual O&M Costs (5 years, 5%) - Factor =					
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 1.33 Present Worth Annual O&M Costs (25 years, 25% per 5 rear interval) - Factor = 2.69 Contingency (20% of O&M Costs)				32,475	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 1.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) OTAL O&M PRESENT WORTH COSTS (30 years)				32,475 20,175	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 1.33 Present Worth Annual O&M Costs (25 years, 25% per 5 rear interval) - Factor = 2.69 Contingency (20% of O&M Costs)				32,475 20,175 10,530 63,180	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 1.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) OTAL O&M PRESENT WORTH COSTS (30 years)				32,475 20,175 10,530	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 1.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes:				32,475 20,175 10,530 63,180	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 1.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual				32,475 20,175 10,530 63,180	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 1.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes:				32,475 20,175 10,530 63,180	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 1,33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2,69 Contingency (20% of O&M Costs) OTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: M - cost manual EE - engineering estimate D - former design D&M - operation and maintenance				32,475 20,175 10,530 63,180	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = .33 Present Worth Annual O&M Costs (25 years, 25% per 5 ear interval) - Factor = 2.69 Contingency (20% of O&M Costs) OTAL O&M PRESENT WORTH COSTS (30 years) OTAL PRESENT WORTH COSTS Iotes: OM - cost manual EE - engineering estimate D - former design	s for years 6 t	0 30		32,475 20,175 10,530 63,180	

Alterna	tive S3 - Rer	noval			
For Andrew Lake Landfill	and Shorelin	ne (SWMU	8 Shoreline)		
For Andrew Lake Landing	Surface Clea	rance	0 01101011110)		
Option:	Surface Clea	alance			
			Unit		
	Unit	Quantity	Costs (\$)	Costs (\$)	Source
IRECT CAPITAL COSTS		70	045	50,310	CM
stall signs at SWMU 8- Shoreline	Sign	78	645		CM
nplement access road closures SWMU 8- Shoreline	Linear foot	60	64	3,846	RA
abor - Surface Clearance (Crew)	Acre	24	1,049	25,176	
laterials/ Equipment - Surface Clearance	Acre	24	153	3,672	RA
obilization/demobillization - Surface Clearance	Lump Sum	0.5	187,400	93,700	RA
ravel- Surface Clearance (Crew) per 30 days	Trip	1	20,400	20,400	RA
er Diem - Surface Clearance (Crew)	Day	2	2,040	4,080	RA
etonation of Cleared Explosives & Post Detonation ampling per 50 Acres Cleared (Labor, Analysis.	Event	1	3,825	3,825	EE
laterials)					
Contingency - 100% Direct Capital Costs Associated with				150,853	
JXO Removal Action				355,862	
Total Direct Capital Costs				333,002	
NDIRECT CAPITAL COSTS					
Apply landuse restrictions at SWMU 8 Shoreline- Danger JXO	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	-
Contingency - (20% Direct and Indirect Capital Costs)				72,172	
Total Indirect Capital Costs				77,172	
	-			433,034	
TOTAL CAPITAL COSTS				100,00	
ANNUAL OPERATION AND MAINTENANCE COSTS		_	_		_
Annual inspection and repair of fences and signs at	Event	1	5,000	5,000	EE
SWMU 8- Shoreline					
Review UXO clearance technologies	Event	0.2	2,500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Labor - Surface Clearance (Crew)	Acre	8	1,049	8,392	RA
Annual Periodic Shoreline Surface Clearance - Materials/	Acre	8	153	1,224	RA
Equipment Annual Periodic Shoreline Surface Clearance -	Lump Sum	0.25	188,000	47,000	RA
Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance- Travel	Trip	0.5	20,400	10,200	RA
(Crew) Annual Periodic Shoreline Surface Clearance Per Diem	Day	1	2,040	2,040	RA
(Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis.	Event	1	3,825	3,825	EE
Materials)					
Annual O&M Costs				80,181	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4 33				347,184	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				215,687	
Contingency (20% of O&M Costs)				112,574	
CONTINUENCY (20 % OF ORM COSTS (20				675,445	
TOTAL O&M PRESENT WORTH COSTS (30 years)	+	-		1,108,479	
TOTAL PRESENT WORTH COSTS	-	_	-	1,.00,478	-
Notes				-	-
CM - cost manual				-	
FF - engineering estimate					
EE - engineering estimate		1			
FD - former design		-			
	page for va-	rs 6 to 30			

Alterna		moval			
	ative S3 - Rei	no (SIA/MI)	8 Shoreline)		
For Andrew Lake Landfil	and Shorell	Tance	o onorenne)		
Option	: 1-foot Clea	rance			
			Unit	- 14 W W W W	1000
	Unit	Quantity	Costs (\$)	Costs (\$)	Source
RECT CAPITAL COSTS	01111				
stall signs at SWMU 8- Shoreline	Sign	78	645	50,310	CM
plement access road closures SWMU 8- Shoreline	Linear foot	60	64	3,846	CM
abor - Surface Clearance (Crew)	Acre	24	1,049	25,176	RA
aterials/ Equipment - Surface Clearance	Acre	24	153	3,672	RA
obilization/demobilization - Surface Clearance	Lump Sum	0.5	187,400	93,700	RA
ravel- Surface Clearance (Crew) per 30 days	Trip	1	20,400	20,400	RA
er Diem - Surface Clearance (Crew)	Day	2	2,040	4,080	RA
abor - Geophysical Survey/Data Managment (Crew)	Acre	1.3	374	486	RA
aterial / Equipment - Geophysical Survey/Data	Acre	1.3	328	426	RA
anagement	Acre	1.0	020		151
obilization/demobillization - Geophysical Survey/Data	Lump Sum	1	294,400	147,200	RA
anagement					
ravel - Geophysical Survey/Data Managment (Crew) per	Trip	1	37,600	37,600	RA
0 days er Diem - Geophysical Survey/Data Managment (Crew)	_		0.000	2,880	RA
er Diem - Geophysical Sulvey/Data Managinem (Cron)	Day	1	2,880	1807.515.55	
abor - UXO Clearance to 1-foot Depth (Crew)	Acre	1.3	2,382	3,097	RA
laterial / Equipment - UXO Clearance to 1-foot Depth	Acre	1.3	374	486	RA
obilization/demobilization - UXO Clearance to 1-foot	Lump Sum	1	600,000	300,000	RA
Pepth	_ap culli	,	A7.00		-
ravel- UXO Clearance to 1-foot Depth (Crew) per 30	Trip	1	48,000	48,000	RA
ays	Davi	1	3,720	3,720	RA
Per Diem - UXO Clearance to 1-foot Depth (Crew)	Day	-	3,720	0,720	101
Detonation of Cleared Explosives & Post Detonation	Event	2	3.825	7,650	EE
sampling per 50 Acres Cleared (Labor, Analysis.	FAGIII		0,520	. ,	
Materials)			1		
	-	-			
	-				
the state of the s	-				
Contingency - 100% Direct Capital Costs Associated with				698,573	
JXO Removal Action	-			1,451,303	
Total Direct Capital Costs			_	1,101,000	
NDIRECT CAPITAL COSTS	-		_		T
Apply landuse restrictions at SWMU 8 Shoreline- Danger	Site	1	5,000	5,000	EE
JXO	-	-	_		_
	-		-		+
					-
					1
					-
				5.000	
Subtotal Indirect Capital Cost				5,000	
Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs)				291,261	
Subtotal Indirect Capital Cost Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs				291,261 296,261	
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs				291,261	
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS				291,261 296,261	
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS	Suppl		5,000	291,261 296,261 1,747,563	EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL INSPECTION AND FERMINE AND SIGNS AT	Event	1	5,000	291,261 296,261 1,747,563 5,000	EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline	Event Event	1 0.2	5,000 2,500	291,261 296,261 1,747,563 5,000 500	EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies			2,500 2,000	291,261 296,261 1,747,563 5,000 500 2,000	EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SVMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars	Event	0.2	2,500	291,261 296,261 1,747,563 5,000 500	EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew)	Event Event Acre	0.2	2,500 2,000 1,049	291,261 296,261 1,747,563 5,000 500 2,000 8,392	EE EE RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials	Event Event Acre	0.2	2,500 2,000	291,261 296,261 1,747,563 5,000 500 2,000	EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SVMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment	Event Event Acre	0.2 1 8 8	2,500 2,000 1,049 153	291,261 296,261 1,747,563 5,000 5,000 2,000 8,392 1,224	EE EE RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobililization	Event Event Acre	0.2 1 8 8	2,500 2,000 1,049	291,261 296,261 1,747,563 5,000 500 2,000 8,392	EE EE RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobililization	Event Event Acre / Acre Lump Sun	0.2 1 8 8	2,500 2,000 1,049 153	291,261 296,261 1,747,563 5,000 5,000 2,000 8,392 1,224	EE EE RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilitzation Annual Periodic Shoreline Surface Clearance-Travel (Crew)	Event Event Acre	0.2 1 8 8	2,500 2,000 1,049 153 188,000	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000	EE EE RA RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobililization Annual Periodic Shoreline Surface Clearance-Travel	Event Event Acre / Acre Lump Sun	0.2 1 8 8	2,500 2,000 1,049 153 188,000	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000	EE EE RA RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL DEPRATION AND MAINTENANCE COSTS ANNUAL DIPERATION AND MAINTENANCE COSTS ANNUAL STORE COST OF THE COST OF	Event Event Acre / Acre Lump Sun Trip	0.2 1 8 8 n 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000	EE EE RA RA RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation	Event Event Acre Acre Lump Sun Trip Day	0.2 1 8 8 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400 2,040	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000 10,200 2,040	EEE RA RA RA RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilitzation Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis.	Event Event Acre / Acre Lump Sun Trip	0.2 1 8 8 n 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000	EE EE RA RA RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation	Event Event Acre Acre Lump Sun Trip Day	0.2 1 8 8 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400 2,040	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000 10,200 2,040	EEE RA RA RA RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilitzation Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis.	Event Event Acre Acre Lump Sun Trip Day	0.2 1 8 8 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400 2,040	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000 10,200 2,040	EEE RA RA RA RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance- Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event Event Acre Acre Lump Sun Trip Day	0.2 1 8 8 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400 2,040	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000 10,200 2,040 3,825	EEE RA RA RA RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs	Event Event Acre / Acre Lump Sun Trip Day Event	0.2 1 8 8 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400 2,040	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000 10,200 2,040	EEE RA RA RA RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Materials Commonial Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor Present Worth Annual O&M Costs (5 years, 5%) - Factor	Event Event Acre / Acre Lump Sun Trip Day Event	0.2 1 8 8 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400 2,040	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000 10,200 2,040 3,825	EEE RA RA RA RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL Inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factore 4 33	Event Event Acre / Acre Lump Sun Trip Day Event	0.2 1 8 8 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400 2,040	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000 10,200 2,040 3,825	EEE RA RA RA RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Facts = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 58)	Event Event Acre / Acre Lump Sun Trip Day Event	0.2 1 8 8 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400 2,040	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000 10,200 2,040 3,825	EEE RA RA RA RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69	Event Event Acre / Acre Lump Sun Trip Day Event	0.2 1 8 8 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400 2,040	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000 10,200 2,040 3,825	EEE EEE RAA RAA RAA RAA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Annual O&M Costo Sampling Per 50 Acres Cleared (Labor, Analysis. Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs)	Event Event Acre / Acre Lump Sun Trip Day Event	0.2 1 8 8 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400 2,040	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000 10,200 2,040 3,825 80,181 347,184 215,687 112,574	EEE EEE RAA RAA RAA RAA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL Inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)	Event Event Acre / Acre Lump Sun Trip Day Event	0.2 1 8 8 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400 2,040	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000 10,200 2,040 3,825 80,181 347,184 215,687 112,574 675,445	EEE EEE RAA RAA RAA RAA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL Inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)	Event Event Acre / Acre Lump Sun Trip Day Event	0.2 1 8 8 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400 2,040	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000 10,200 2,040 3,825 80,181 347,184 215,687 112,574	EEE EEE RAA RAA RAA RAA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Facte = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)	Event Event Acre / Acre Lump Sun Trip Day Event	0.2 1 8 8 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400 2,040	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000 10,200 2,040 3,825 80,181 347,184 215,687 112,574 675,445	EEE RA RA RA RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (5 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS	Event Event Acre / Acre Lump Sun Trip Day Event	0.2 1 8 8 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400 2,040	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000 10,200 2,040 3,825 80,181 347,184 215,687 112,574 675,445	EEE RA RA RA RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL DEPRATION AND MAINTENANCE COSTS ANNUAL Inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual	Event Event Acre / Acre Lump Sun Trip Day Event	0.2 1 8 8 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400 2,040	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000 10,200 2,040 3,825 80,181 347,184 215,687 112,574 675,445	EEE RA RA RA RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Annual inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Facte = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS Notes: CM - cost manual EE - engineering estimate	Event Event Acre / Acre Lump Sun Trip Day Event	0.2 1 8 8 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400 2,040	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000 10,200 2,040 3,825 80,181 347,184 215,687 112,574 675,445	EEE RA RA RA RA
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL OPERATION AND MAINTENANCE COSTS ANNUAL DEPRATION AND MAINTENANCE COSTS ANNUAL Inspection and repair of fences and signs at SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual	Event Event Acre / Acre Lump Sun Trip Day Event	0.2 1 8 8 0.25 0.5	2,500 2,000 1,049 153 188,000 20,400 2,040	291,261 296,261 1,747,563 5,000 500 2,000 8,392 1,224 47,000 10,200 2,040 3,825 80,181 347,184 215,687 112,574 675,445	EEE RA RA RA RA

	V-47 (continuative S3 - Re				
			9 Charalina)		
For Andrew Lake Landfil	n: 4-foot Clea		o onoreline)		
Option	1: 4-100t Clea	Irance			
			Unit		
	Unit	Quantity	Costs (\$)	Costs (\$)	Source
IRECT CAPITAL COSTS				T	•
nstall signs at SWMU 8- Shoreline	Sign	78	645	50,310	CM
nplement access road closures SWMU 8- Shoreline	Linear foot	60	64	3,846	CM
abor - Surface Clearance (Crew)	Acre	24	1,049	25,176	RA
Materials/ Equipment - Surface Clearance	Acre	24	153	3,672	RA
Mobilization/demobilization - Surface Clearance	Lump Sum	0.5	187,400	93,700	RA
ravel- Surface Clearance (Crew) per 30 days	Trip	1	20,400	20,400	RA
Per Diem - Surface Clearance (Crew)	Day	2	2,040	4,080	RA
abor - Geophysical Survey/Data Managment (Crew)	Acre	1.3	374	486	RA
Material / Equipment - Geophysical Survey/Data				406	RA
Management	Acre	1.3	328	426	IVA
Mobilization/demobillization - Geophysical Survey/Data	Lumm Sum	1	294.400	147,200	RA
Management	Lump Sum	1	294,400	147,200	100
ravel - Geophysical Survey/Data Managment (Crew) per	Trip	1	37,600	37,600	RA
30 days	THP		37,000	37,000	101
Per Diem - Geophysical Survey/Data Managment (Crew)	Day	1	2.880	2,880	RA
	Day		791.01.0		0.53
abor - UXO Clearance to 4-foot Depth (Crew)	Acre	1.3	13,233	17,203	RA
Material / Equipment - UXO Clearance to 4-foot Depth	Acre	1.3	1,744	2,267	RA
Mobilization/demobilization - UXO Clearance to 4-foot	Lump Sum	1	600,000	300,000	RA
Depth	rump oum		000,000	555,000	104
Fravel - UXO Clearance to 4-foot Depth (Crew) per 30	Trip	1	48,000	48.000	RA
days	Trip			301303	0.50
Per Diem - UXO Clearance to 4-foot Depth (Crew)	Day	1	3,720	3,720	RA
Detonation of Cleared Explosives & Post Detonation					
Sampling per 50 Acres Cleared (Labor, Analysis.	Event	3	3,825	11,475	EE
Materials)					
		U			
Contingency - 100% Direct Capital Costs Associated with					
UXO Removal Action				718,286	
Total Direct Capital Costs				1,490,728	
NDIRECT CAPITAL COSTS	77.	75.7	144 144 1		
Apply landuse restrictions at SWMU 8 Shoreline- Danger				5.000	EE
UXO	Site	- 1	5,000	5,000	
3,0					
		-			_
		-			+
	-	-			+
					-
	-				-
					+
					-
Subtotal Indirect Capital Cost				5,000	-
Contingency - (20% Direct and Indirect Capital Costs)				299,146	_
Total Indirect Capital Costs				304,146	
TOTAL CAPITAL COSTS				1,794,874	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual inspection and repair of fences and signs at	Frank	1	5.000	5.000	EE
	Event	1	0,000	5,000	22
SWMU 8- Shoreline	Event	0.2	2,500	500	EE
SWMU 8- Shoreline Review UXO clearance technologies	Event Event	0.2	2,500 2,000	500 2,000	EE EE
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars					
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew)	Event Acre	1 8	2,000 1,049	2,000 8,392	EE RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/	Event Acre	1	2,000	2,000	EE
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment	Event Acre Acre	1 8 8	2,000 1,049 153	2,000 8,392 1,224	EE RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance -	Event Acre	1 8 8	2,000 1,049	2,000 8,392	EE RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobililization	Event Acre Acre Lump Sum	1 8 8 0.25	2,000 1,049 153 188,000	2,000 8,392 1,224 47,000	EE RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobililization Annual Periodic Shoreline Surface Clearance- Travel	Event Acre Acre	1 8 8	2,000 1,049 153	2,000 8,392 1,224	EE RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance-Travel (Crew)	Event Acre Acre Lump Sum Trip	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400	2,000 8,392 1,224 47,000 10,200	RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance-Travel (Crew) Annual Periodic Shoreline Surface Clearance-Travel	Event Acre Acre Lump Sum	1 8 8 0.25	2,000 1,049 153 188,000	2,000 8,392 1,224 47,000	EE RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobililization Annual Periodic Shoreline Surface Clearance-Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew)	Event Acre Acre Lump Sum Trip	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400	2,000 8,392 1,224 47,000 10,200	RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance-Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation	Event Acre Acre Lump Sum Trip	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400	2,000 8,392 1,224 47,000 10,200	RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilitzation Annual Periodic Shoreline Surface Clearance-Travel (Crew) Annual Periodic Shoreline Surface Clearance-Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis	Event Acre Acre Lump Sum Trip Day	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400 2,040	2,000 8,392 1,224 47,000 10,200 2,040	RA RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance- Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis	Event Acre Acre Lump Sum Trip Day	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400 2,040	2,000 8,392 1,224 47,000 10,200 2,040	RA RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance- Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis	Event Acre Acre Lump Sum Trip Day	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400 2,040	2,000 8,392 1,224 47,000 10,200 2,040	RA RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance- Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event Acre Acre Lump Sum Trip Day	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400 2,040	2,000 8,392 1,224 47,000 10,200 2,040 3,825	RA RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance-Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis Materials) Annual O&M Costs	Event Acre Acre Lump Sum Trip Day Event	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400 2,040	2,000 8,392 1,224 47,000 10,200 2,040	RA RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance-Travel (Crew) Annual Periodic Shoreline Surface Clearance-Travel (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor	Event Acre Acre Lump Sum Trip Day Event	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400 2,040	2,000 8,392 1,224 47,000 10,200 2,040 3,825	RA RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33	Event Acre Acre Lump Sum Trip Day Event	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400 2,040	2,000 8,392 1,224 47,000 10,200 2,040 3,825	RA RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5	Event Acre Acre Lump Sum Trip Day Event	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400 2,040	2,000 8,392 1,224 47,000 10,200 2,040 3,825 80,181 347,184	RA RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance-Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69	Event Acre Acre Lump Sum Trip Day Event	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400 2,040	2,000 8,392 1,224 47,000 10,200 2,040 3,825 80,181 347,184 215,687	RA RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs)	Event Acre Acre Lump Sum Trip Day Event	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400 2,040	2,000 8,392 1,224 47,000 10,200 2,040 3,825 80,181 347,184 215,687 112,574	RA RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance- Travel (Crew) Annual Periodic Shoreline Surface Clearance- Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2 c9 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)	Event Acre Acre Lump Sum Trip Day Event	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400 2,040	2,000 8,392 1,224 47,000 10,200 2,040 3,825 80,181 347,184 215,687 112,574 675,445	RA RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance- Travel (Crew) Annual Periodic Shoreline Surface Clearance- Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2 c9 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)	Event Acre Acre Lump Sum Trip Day Event	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400 2,040	2,000 8,392 1,224 47,000 10,200 2,040 3,825 80,181 347,184 215,687 112,574	RA RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance-Travel (Crew) Annual Periodic Shoreline Surface Clearance-Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69	Event Acre Acre Lump Sum Trip Day Event	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400 2,040	2,000 8,392 1,224 47,000 10,200 2,040 3,825 80,181 347,184 215,687 112,574 675,445	RA RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance-Travel (Crew) Annual Periodic Shoreline Surface Clearance-Travel (Crew) Annual Periodic Shoreline Surface Clearance-Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)	Event Acre Acre Lump Sum Trip Day Event	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400 2,040	2,000 8,392 1,224 47,000 10,200 2,040 3,825 80,181 347,184 215,687 112,574 675,445	RA RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance - Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS	Event Acre Acre Lump Sum Trip Day Event	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400 2,040	2,000 8,392 1,224 47,000 10,200 2,040 3,825 80,181 347,184 215,687 112,574 675,445	RA RA RA RA
SWMU 8- Shoreline Review UXO clearance technologies Conduct annual resident seminars Labor - Surface Clearance (Crew) Annual Periodic Shoreline Surface Clearance - Materials/ Equipment Annual Periodic Shoreline Surface Clearance - Mobilization/ demobilization Annual Periodic Shoreline Surface Clearance- Travel (Crew) Annual Periodic Shoreline Surface Clearance- Per Diem (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS Notes: CM - cost manual	Event Acre Acre Lump Sum Trip Day Event	1 8 8 0.25 0.5	2,000 1,049 153 188,000 20,400 2,040	2,000 8,392 1,224 47,000 10,200 2,040 3,825 80,181 347,184 215,687 112,574 675,445	RA RA RA RA

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For Andrew Lake Landfi			8 Shoreline)		
	: 10-foot Clea		o orioreline)		
		V-	Unit		
A PERSON NAMED IN COLUMN 1997	Unit	Quantity	Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS	Cien	78	645	50.310	CM
nstall signs at SWMU 8- Shoreline mplement access road closures SWMU 8- Shoreline	Sign Linear foot	60	64	3,846	CM
abor - Surface Clearance (Crew)	Acre	24	1,049	25,176	RA
Materials/ Equipment - Surface Clearance	Acre	24	153	3,672	RA
Mobilization/demobilization - Surface Clearance	Lump Sum	0.5	187,400	93,700	RA
ravel- Surface Clearance (Crew) per 30 days	Trip	1	20,400	20,400	RA
Per Diem - Surface Clearance (Crew)	Day	2	2,040	4,080	RA
abor - Geophysical Survey/Data Managment (Crew)	Acre	1.3	374	486	RA
Material / Equipment - Geophysical Survey/Data Management	Acre	1.3	328	426	RA
Mobilization/demobillization - Geophysical Survey/Data Management	Lump Sum	1	294,400	147,200	RA
ravel - Geophysical Survey/Data Managment (Crew) per 0 days	Trip	1	37,600	37,600	RA
Per Diem - Geophysical Survey/Data Managment (Crew)	Day	1	2,880	2,880	RA
abor - UXO Clearance to 10-foot Depth Dig & Screen Method (Crew)	Acre	1.3	489,000	635,700	RA
Material / Equipment - UXO Clearance to 10-foot Depth Dig & Screen Method	Acre	1.3	287,500	373,750	RA
Mobilization/demobilization - UXO Clearance to 10-foot Depth Dig & Screen Method	Lump Sum	1	600,000	300,000	RA
Travel - UXO Clearance to 10-foot Depth Dig & Screen	Trip	1	115,000	115,000	RA
Method (Crew) per 30 days Per Diem - UXO Clearance to 10-foot Depth Dig & Screen	Day	14	8,880	124,320	RA
Method (Crew) Detonation of Cleared Explosives & Post Detonation	· ·				
Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event	5	3,825	19,125	EE
Contingency - 100% Direct Capital Costs Associated with					
UXO Removal Action				1,903,516	
Total Direct Capital Costs	1			3,861,187	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at SWMU 8 Shoreline- Danger	Site	1	5,000	5,000	EE
UXO					-
	-				-
	-				1
					_
					1
Subtotal Indirect Capital Cost				5,000	
Contingency - (20% Direct and Indirect Capital Costs)				773,237	
Total Indirect Capital Costs				778,237	-
TOTAL CAPITAL COSTS				4,639,425	
ANNUAL OPERATION AND MAINTENANCE COSTS			,		_
Annual inspection and repair of fences and signs at SWMU	Event	1	5,000	5,000	EE
8- Shoreline Review UXO clearance technologies	Event	0.2	2,500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Labor - Surface Clearance (Crew)	Acre	8	1,049	8,392	RA
Annual Periodic Shoreline Surface Clearance - Materials/ Equipment	Acre	8	153	1,224	RA
Annual Periodic Shoreline Surface Clearance - Mobilization	Lump Sum	0.25	188,000	47,000	RA
gemodilization		0.5	20,400	10,200	RA
Annual Periodic Shoreline Surface Clearance- Travel	Trip	0.5			
Annual Penodic Shoreline Surface Clearance- Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem	Trip	1	2,040	2,040	RA
Annual Penodic Shoreline Surface Clearance- Travel (Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation	<u> </u>	-		2,040 3,825	RA EE
Annual Penodic Shoreline Surface Clearance- Travel Crew) Annual Periodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis.	Day	1	2,040 3,825		-
Annual Penodic Shoreline Surface Clearance- Travel (Crew) Annual Penodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Day	1		3,825	-
Annual Penodic Shoreline Surface Clearance- Travel Crew) Annual Penodic Shoreline Surface Clearance Per Diem Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor =	Day	1		3,825	
Annual Penodic Shoreline Surface Clearance- Travel (Crew) Annual Penodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5	Day	1		3,825 80,181 347,184	
Annual Penodic Shoreline Surface Clearance- Travel (Crew) Annual Penodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69	Day	1		3,825 80,181 347,184 215,687	-
Annual Penodic Shoreline Surface Clearance- Travel Crew) Annual Penodic Shoreline Surface Clearance Per Diem Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis, Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs)	Day	1		3,825 80,181 347,184 215,687 112,574	
demobilization Annual Penodic Shoreline Surface Clearance-Travel (Crew) Annual Penodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis, Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)	Day	1		3,825 80,181 347,184 215,687	
Annual Penodic Shoreline Surface Clearance- Travel (Crew) Annual Penodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS	Day	1		3,825 80,181 347,184 215,687 112,574 675,445	-
Annual Penodic Shoreline Surface Clearance- Travel (Crew) Annual Penodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual	Day	1		3,825 80,181 347,184 215,687 112,574 675,445	
Annual Penodic Shoreline Surface Clearance- Travel (Crew) Annual Penodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual EE - engineering estimate	Day	1		3,825 80,181 347,184 215,687 112,574 675,445	-
Annual Penodic Shoreline Surface Clearance- Travel (Crew) Annual Penodic Shoreline Surface Clearance Per Diem (Crew) Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials) Annual O&M Costs Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual	Day	1		3,825 80,181 347,184 215,687 112,574 675,445	

Altern	ative S3 - Re	moval			
	r Impact Are				
	Surface Cle				
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS			500	07.450	1 014
nstall signs at UXO site	Sign	171	568	97,152	CM
nstall Fencing at UXO site	Liner foot	11,400	29	326,610	CM
mplement access road closures at UXO site	Liner foot	30	64	1,923	CM
_abor - Surface Clearance (Crew)	Acre	380	1,049	398,620	RA
Materials/ Equipment - Surface Clearance	Lump Sum	380	153	58,140	RA
Mobilization/demobillization - Surface Clearance	Lump Sum	1	187,400	187,400	_
Travel- Surface Clearance (Crew) per 30 days	Trip	1	20,400	20,400	RA
Per Diem - Surface Clearance (Crew)	Day	32	2,040	65,280	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event	2	3,825	7,650	EE
Contingency - 100% Direct Capital Costs Associated with				700.440	
UXO Removal Action Total Direct Capital Costs				739,413 1,902,588	
INDIRECT CAPITAL COSTS		4, 4			
Apply landuse restrictions at UXO site (Military Reserve Only)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency - (20% Direct and Indirect Capital Costs)		1		381,518	
Total Indirect Capital Costs				386,518	
TOTAL CAPITAL COSTS				2,289,106	
ANNUAL OPERATION AND MAINTENANCE COSTS				254	
Monitor Sediment at 2 Locations	Event	1	4,432	4,432	EE
	Event	1	3,600	3,600	EE
Monitoring Report Annual inspection and repair of fences and signs at UXO	Event	1	5,000	5,000	EE
site Review UXO clearance technologies	Event	0.2	2,500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
AI COM Contr				15,532	
Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor =	=			67.254	
4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				41,781	
Contingency (20% of O&M Costs)				21,807	
TOTAL O&M PRESENT WORTH COSTS (30 years)				130,842	
TOTAL PRESENT WORTH COSTS (30 years)				2,419,947	_
		-		2,410,041	-
Notes: CM - cost manual					
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years	are for years	6 to 30	1		
CLEIN COOLS DISCHINGTED ATTITUDITY TO YEARS O'LO J, CYETY O'YE	years	ust 11, 1997			-

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	native S3 - Re				-
	ar Impact Are				
Optio	n: 1-foot Clea	arance			
	200 100 100	5 m m 2 m	Unit		1
DIDECT CARITAL COCTS	Unit	Quantity	Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS Install signs at UXO site	Cinn	171	568	07.450	1 014
Install Fencing at UXO site	Sign Liner foot	11,400	29	97,152 326,610	CM
Implement access road closures at UXO site	Liner foot	30	64	1,923	CM
Labor - Surface Clearance (Crew)	Acre	380	1,049	398,620	RA
Materials/ Equipment - Surface Clearance	Lump Sum	380	153	58,140	RA
Mobilization/demobillization - Surface Clearance	Lump Sum	1	187,400	187,400	RA
Travel- Surface Clearance (Crew) per 30 days	Trip	1	20,400	20,400	RA
Per Diem - Surface Clearance (Crew)	Day	1	2,040	2,040	RA
Labor - Geophysical Survey/Data Managment (Crew)	Acre	380	2,595	986,100	RA
Material / Equipment - Geophysical Survey/Data Management	Acre	380	328	124,640	RA
Mobilization/demobillization - Geophysical Survey/Data Management	Lump Sum	1	294,400	294,400	RA
Travel - Geophysical Survey/Data Managment (Crew) per 30 days	Trip	2	37,600	75,200	RA
Per Diem - Geophysical Survey/Data Managment (Crew)	Day	48	2,880	138,240	RA
Labor - UXO Clearance to 1-foot Depth (Crew)	Acre	380	2,382	905,160	RA
Material / Equipment - UXO Clearance to 1-foot Depth	Acre	380	374	142,120	RA
Mobilization/demobilization - UXO Clearance to 1-foot Depth	Lump Sum	1	600,000	600,000	RA
Travel- UXO Clearance to 1-foot Depth (Crew) per 30 days	Trip	2	48,000	96,000	RA
Per Diem - UXO Clearance to 1-foot Depth (Crew)	Day	38	3,720	141,360	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis.	Event	4	3,825	15,300	EE
Materials)					
					-
Contingency - 100% Direct Capital Costs Associated with UXO Removal Action				4,187,043	
Total Direct Capital Costs				8,797,848	-
INDIRECT CAPITAL COSTS				0,1.01,010	
Apply landuse restrictions at UXO site (Military Reserve					T
Only)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency - (20% Direct and Indirect Capital Costs)				1,760,570	
Total Indirect Capital Costs				1,765,570	
TOTAL CAPITAL COSTS				10,563,418	
ANNUAL OPERATION AND MAINTENANCE COSTS				10,000,410	
Monitor Sediment at 2 Locations	Event	1	4,432	4,432	EE
Monitoring Report	Event	1	3,600	3,600	EE
Annual inspection and repair of fences and signs at UXO		1	50 N 000		
	Event		5,000	5,000	EE
Site			113.55		
Review UXO clearance technologies	Event	0.2	2,500	500	EE
Review UXO clearance technologies	Event Event			500 2,000	EE
Review UXO clearance technologies		0.2	2,500		
Review UXO clearance technologies		0.2	2,500		
Review UXO clearance technologies		0.2	2,500		
Review UXO clearance technologies		0.2	2,500		
Review UXO clearance technologies		0.2	2,500		
Review UXO clearance technologies Conduct annual resident seminars		0.2	2,500	2,000	
Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor		0.2	2,500		
Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33		0.2	2,500	2,000	
Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5		0.2	2,500	2,000	
Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69		0.2	2,500	2,000 15,532 67,254 41,781	
Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Peresent Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs)		0.2	2,500	2,000 15,532 67,254 41,781 21,807	
Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)		0.2	2,500	2,000 15,532 67,254 41,781	
Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS		0.2	2,500	2,000 15,532 67,254 41,781 21,807	
Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes		0.2	2,500	2,000 15,532 67,254 41,781 21,807 130,842	
Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Peresent Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes CM - cost manual		0.2	2,500	2,000 15,532 67,254 41,781 21,807 130,842	
Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.93 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes CM - cost manual EE - engineering estimate		0.2	2,500	2,000 15,532 67,254 41,781 21,807 130,842	
Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL OST SOUTH COSTS Notes DM - cost manual EE - engineering estimate ED - former design		0.2	2,500	2,000 15,532 67,254 41,781 21,807 130,842	
Annual O&M Costs Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Votes CM - cost manual	Event	0.2	2,500	2,000 15,532 67,254 41,781 21,807 130,842	

	e V-48 (continue S3 - Re				-
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	ar Impact Are				-
Optio	n: 4-foot Clea	arance			+
5 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -			Unit		
	Unit	Quantity	Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS	Cian	171	568	07.150	CM
Install signs at UXO site	Sign	171	29	97,152	CM
Install Fencing at UXO site	Liner foot	11,400		326,610	CM
Implement access road closures at UXO site	Liner foot	30	64	1,923	CM
Labor - Surface Clearance (Crew)	Acre	380	1,049	398,620	RA
Materials/ Equipment - Surface Clearance	Lump Sum	380	153	58,140	RA
Mobilization/demobilization - Surface Clearance	Lump Sum	1	187,400	187,400	RA
Travel- Surface Clearance (Crew) per 30 days	Trip	1	20,400	20,400	RA
Per Diem - Surface Clearance (Crew)	Day	32	2,040	65,280	RA
Labor - Geophysical Survey/Data Managment (Crew)	Acre	380	2,595	986,100	RA
Material / Equipment - Geophysical Survey/Data Management	Acre	380	328	124,640	RA
Mobilization/demobillization - Geophysical Survey/Data Management	Lump Sum	1	294,400	294,400	RA
Travel - Geophysical Survey/Data Managment (Crew) per	Trip	2	37,600	75,200	RA
30 days Per Diem - Geophysical Survey/Data Managment (Crew)	Day	48	2.880	138,240	RA
Laborativo Classica Control Control					
Labor - UXO Clearance to 4-foot Depth (Crew)	Acre	380	13,233	5,028,665	RA
Material / Equipment - UXO Clearance to 4-foot Depth	Acre	380	1,744	662,720	RA
Mobilization/demobillization - UXO Clearance to 4-foot Depth	Lump Sum	1	600,000	600,000	RA
Travel - UXO Clearance to 4-foot Depth (Crew) per 30 days	Trip	7	48.000	336,000	RA
Per Diem - UXO Clearance to 4-foot Depth (Crew)	Day	211	3 720	784,920	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis.	Event	6	3 825	22 950	EE
Materials)	Event	Ü	3 023	22,930	
Contingency - 100% Direct Capital Costs Associated with					
UXO Removal Action				9,785,598	
Total Direct Capital Costs				19,994,959	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at UXO site (Military Reserve					T
Only)	Site	1	5 000	5,000	EE
Citiff					_
					-
					-
Subtotal Indirect Capital Cost				5,000	
	1			3 000 003	+
Contingency - (20% Direct and Indirect Capital Costs)				3,999,992	
Total Indirect Capital Costs				4,004,992	
Total Indirect Capital Costs TOTAL CAPITAL COSTS					
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS				4,004,992 23,999,951	
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations	Event	1	4,432	4,004,992 23,999,951 4,432	EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations	Event Event	1 1	4,432 3,600	4,004,992 23,999,951	EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO				4,004,992 23,999,951 4,432	
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site	Event Event	1	3,600 5,000	4,004,992 23,999,951 4,432 3,600 5,000	EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies	Event Event Event	1 1 0.2	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000	EE EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site	Event Event	1	3,600 5,000	4,004,992 23,999,951 4,432 3,600 5,000	EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies	Event Event Event	1 1 0.2	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000	EE EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies	Event Event Event	1 1 0.2	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000	EE EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies	Event Event Event	1 1 0.2	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000	EE EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars	Event Event Event	1 1 0.2	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000 500 2,000	EE EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars	Event Event Event	1 1 0.2	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000	EE EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars	Event Event Event	1 1 0.2	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000 500 2,000	EE EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5	Event Event Event	1 1 0.2	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000 500 2,000	EE EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69	Event Event Event	1 1 0.2	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000 500 2,000 15,532 67,254 41,781	EE EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4 33 Present Worth Annual O&M Costs (25 years, 25% per 5 years interval) - Factor = 2 69 Contingency (20% of O&M Costs)	Event Event Event	1 1 0.2	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000 500 2,000	EE EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)	Event Event Event	1 1 0.2	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000 500 2,000 15,532 67,254 41,781	EE EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69	Event Event Event	1 1 0.2	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000 500 2,000 15,532 67,254 41,781 21,807	EE EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)	Event Event Event	1 1 0.2	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000 5,000 2,000 15,532 67,254 41,781 21,807 130,842	EE EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)	Event Event Event	1 1 0.2	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000 5,000 2,000 15,532 67,254 41,781 21,807 130,842	EE EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual	Event Event Event	1 1 0.2	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000 5,000 2,000 15,532 67,254 41,781 21,807 130,842	EE EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 years interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes CM - cost manual EE - engineering estimate	Event Event Event	1 1 0.2	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000 5,000 2,000 15,532 67,254 41,781 21,807 130,842	EE EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes CM - cost manual EE - engineering estimate FD - former design	Event Event Event	1 1 0.2	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000 5,000 2,000 15,532 67,254 41,781 21,807 130,842	EE EE
Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL OR PRESENT WORTH COSTS Notes	Event Event Event Event	1 1 0.2 1	3,600 5,000 2,500	4,004,992 23,999,951 4,432 3,600 5,000 5,000 2,000 15,532 67,254 41,781 21,807 130,842	EE EE

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	r Impact Are				
	: 10-foot Cle				
Орион	. 10-100t Cle	arance			
	Unit	Quantity	Unit Costs (\$)	Costs (\$)	Source
DIRECT CAPITAL COSTS					
nstall signs at UXO site	Sign	171	568	97,152	CM
nstall Fencing at UXO site	Liner foot	11,400	29	326,610	CM
mplement access road closures at UXO site	Liner foot	30	64	1,923	CM
Labor - Surface Clearance (Crew)	Acre	380	1,049	398,620	RA
Materials/ Equipment - Surface Clearance	Lump Sum	380	153	58,140	RA
Mobilization/demobillization - Surface Clearance	Lump Sum	1	187,400	187,400	RA
Fravel- Surface Clearance (Crew) per 30 days	Trip	1	20,400	20,400	RA
Per Diem - Surface Clearance (Crew)	Day	32	2,040	65,280	RA
_abor - Geophysical Survey/Data Managment (Crew)	Acre	320	2,595	830,296	RA
Material / Equipment - Geophysical Survey/Data	Acre	320	328	104,947	RA
Management Mobilization/demobillization - Geophysical Survey/Data		1	294,400	294,400	RA
Management Fravel - Geophysical Survey/Data Managment (Crew) per	Lump Sum				
30 days Per Diem - Geophysical Survey/Data Managment (Crew)	Trip	2	37,600	75,200	RA
_abor - UXO Clearance to 10-foot Depth Dig & Screen	Day	48	2,880	138,240	RA
Method (Crew)	Acre	320	489,000	156,480,000	RA
Material / Equipment - UXO Clearance to 10-foot Depth Dig & Screen Method Mobilization/demobillization - UXO Clearance to 10-foot	Acre	320	287,500	92,000,000	RA
Depth Dig & Screen Method	Lump Sum	1	600,000	600,000	RA
Travel - UXO Clearance to 10-foot Depth Dig & Screen Method (Crew) per 30 days	Trip	95	115,000	10,925,000	RA
Per Diem - UXO Clearance to 10-foot Depth Dig & Screen Method (Crew)	Day	2,902	8,880	25,769,760	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event	8	3,825	30,600	EE
Contingency - 100% Direct Capital Costs Associated with UXO Removal Action Total Direct Capital Costs		14		287,980,206 576,384,174	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at UXO site (Military Reserve Only)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
				0,000	
				115,277,835	
Contingency - (20% Direct and Indirect Capital Costs)					
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs				115,277,835	
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS				115,277,835 115,282,835	
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS	Eyent	1	4.432	115,277,835 115,282,835 691,667,009	FF
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations	Event Event	1 1	4,432 3,600	115,277,835 115,282,835 691,667,009	EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report	Event	1	3,600	115,277,835 115,282,835 691,667,009 4,432 3,600	EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO				115,277,835 115,282,835 691,667,009	
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site	Event Event	1	3,600 5,000	115,277,835 115,282,835 691,667,009 4,432 3,600 5,000	EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies	Event Event Event	1 1 0.2	3,600 5,000 2,500	115,277,835 115,282,835 691,667,009 4,432 3,600 5,000	EE EE EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies	Event Event	1	3,600 5,000	115,277,835 115,282,835 691,667,009 4,432 3,600 5,000	EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies	Event Event Event	1 1 0.2	3,600 5,000 2,500	115,277,835 115,282,835 691,667,009 4,432 3,600 5,000	EE EE EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars	Event Event Event	1 1 0.2	3,600 5,000 2,500	115,277,835 115,282,835 691,667,009 4,432 3,600 5,000 500 2,000	EE EE EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars	Event Event Event	1 1 0.2	3,600 5,000 2,500	115,277,835 115,282,835 691,667,009 4,432 3,600 5,000	EE EE EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33	Event Event Event	1 1 0.2	3,600 5,000 2,500	115,277,835 115,282,835 691,667,009 4,432 3,600 5,000 500 2,000	EE EE EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5	Event Event Event	1 1 0.2	3,600 5,000 2,500	115,277,835 115,282,835 691,667,009 4,432 3,600 5,000 500 2,000	EE EE EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69	Event Event Event	1 1 0.2	3,600 5,000 2,500	115,277,835 115,282,835 691,667,009 4,432 3,600 5,000 5,000 2,000 15,532 67,254	EE EE EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs)	Event Event Event	1 1 0.2	3,600 5,000 2,500	115,277,835 115,282,835 691,667,009 4,432 3,600 5,000 500 2,000 15,532 67,254 41,781 21,807	EE EE EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years)	Event Event Event	1 1 0.2	3,600 5,000 2,500	115,277,835 115,282,835 691,667,009 4,432 3,600 5,000 5,000 2,000 15,532 67,254 41,781	EE EE EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes:	Event Event Event	1 1 0.2	3,600 5,000 2,500	115,277,835 115,282,835 691,667,009 4,432 3,600 5,000 5,000 2,000 15,532 67,254 41,781 21,807 130,842	EE EE EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL ORD TO	Event Event Event	1 1 0.2	3,600 5,000 2,500	115,277,835 115,282,835 691,667,009 4,432 3,600 5,000 5,000 2,000 15,532 67,254 41,781 21,807 130,842	EE EE EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes: CM - cost manual EE - engineering estimate	Event Event Event	1 1 0.2	3,600 5,000 2,500	115,277,835 115,282,835 691,667,009 4,432 3,600 5,000 5,000 2,000 15,532 67,254 41,781 21,807 130,842	EE EE EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS Notes CM - cost manual EE - engineering estimate FD - former design	Event Event Event	1 1 0.2	3,600 5,000 2,500	115,277,835 115,282,835 691,667,009 4,432 3,600 5,000 5,000 2,000 15,532 67,254 41,781 21,807 130,842	EE EE EE
Contingency - (20% Direct and Indirect Capital Costs) Total Indirect Capital Costs TOTAL CAPITAL COSTS ANNUAL OPERATION AND MAINTENANCE COSTS Monitor Sediment at 2 Locations Monitoring Report Annual inspection and repair of fences and signs at UXO site Review UXO clearance technologies Conduct annual resident seminars Annual O&M Costs Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33 Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69 Contingency (20% of O&M Costs) TOTAL O&M PRESENT WORTH COSTS (30 years) TOTAL PRESENT WORTH COSTS Notes:	Event Event Event Event	1 1 0.2 1	3,600 5,000 2,500	115,277,835 115,282,835 691,667,009 4,432 3,600 5,000 5,000 2,000 15,532 67,254 41,781 21,807 130,842	EE EE EE

		Table V-49	
	Cummany of Coo		in for UVO Citor
	Summary of Cos	ts by Remedial Alternati	ive for UXO Sites
Remedial Alternative	Capital (\$)	Annual O&M (\$)	Total Present Worth Cost (\$)
Alternative 1 - No Action			
All UXO Sites	0	0	0
Alternative S2 - Institutional			
Controls			
SWMU 1	687,000	16,000	820,000
SWMU 2	229,000	7,500	292,000
SWMU 8	71,000	7,500	134,000
SA 93	517,000	16,000	648,000
Alternative S3 - Removal			
Option: Surface Clearance			
SWMU 1	164,347,000	16,000	164,480,000
SWMU 2	103,629,000	7,500	103,692,000
SWMU 8	433,000	80,000	1,108,000
SA 93	2,289,000	16,000	2,420,000
	2,200,000	10,000	2,420,000
Alternative S3 - Removal			
Option: 1-foot Clearance	477.070.000	10.000	
SWMU 1	177,678,000	16,000	177,811,000
SWMU 2	103,629,000	7,500	103,692,000
SWMU 8	1,748,000	80,000	2,423,000
SA 93	10,563,000	16,000	10,694,000
Alternative S3 - Removal			
Option: 4-feet Clearance			
SWMU 1	204,216,000	16,000	204,350,000
SWMU 2	103,629,000	7,500	103,692,000
SWMU 8	1,795,000	80,000	2,470,000
SA 93	24,000,000	16,000	24,131,000
Alternative S3 - Removal			
Option: 10-feet Clearance			
SWMU 1	1,116,382,000	16,000	1,116,516,000
SWMU 2	103,629,000	7,500	103,692,000
SWMU 8	4,639,000	80,000	5,315,000
SA 93	691,667,000	16,000	691,798,000
NOTES:			
NOTES:			
UXO Sites:	Andrew Lels-Mar-4- C. I	D19: D	
SWMU 1	Andrew Lake Waste Orde	nance Demolition Range	
SWMU 2	Causeway Minefield		
SWMU 8	Andrew Lake Landfill and	Shoreline	
SA 93	Mortar Impact Area		
O & M	Operation and Maintenance		

Table V-50 Affected Surface Areas by UXO Remedial Alternative

	Affe			
Remedial Alternative and Clearance Option	SWMU 1	SWMU 2	SWMU 8	SA 93
Alternative S2 - Institutional Controls	890	45	25.3	380
Alternative S3 - Removal				
Option: Surface Clearance				
Explosive Breaching (Acres)	70	45	-	
Surface Clearance (Acres)	890	45	24	380
Alternative S3 - Removal				
Option: 1-foot Clearance				
Explosive Breaching (Acres)	70	45	J.	
Surface Clearance (Acres)	890	45	24	380
Geophysical Survey/Data Management (Acres)	730	•	1.3	380
1-foot Clearance (Acres)	730	•	1.3	380
Alternative S3 - Removal				
Option: 4-feet Clearance				
Explosive Breaching (Acres)	70	45	-	
Surface Clearance (Acres)	890	45	24	380
Geophysical Survey/Data Management (Acres)	730		1.3	380
4-foot Clearance (Acres)	730		1.3	380
Alternative S3 - Removal				
Option: 10-feet Clearance				
Explosive Breaching (Acres)	70	45	•	*
Surface Clearance (Acres)	890	45	24	380
Geophysical Survey/Data Management (Acres)	640		1.3	320
10-foot Clearance (Acres)	640		1.3	320

NOTES: UXO Sites SWMU 1

SWMU 2 SWMU 8 SA 93

Andrew Lake Waste Ordnance Demolition Range Causeway Minefield

Andrew Lake Landfill and Shoreline

Mortar Impact Area

Table V-51 Affected Surface Areas and Costs by UXO Remedial Alternative

	Affected Surface Area (Acres)					
Remedial Alternative and Clearance Option	SWMU 1	SWMU 2	SWMU 8	SA 93	All UXO Sites	
Alternative S2 - Institutional Controls Total Present Worth Cost (\$):	890 \$820,000	45 \$292,000	25.3 \$134,000	380 \$648,000	1340.3 \$1,894,000	
Alternative S3 - Removal Option: Surface Clearance Explosive Breaching (Acres) Surface Clearance (Acres) Total Present Worth Cost (\$):	70 890 \$164,480,000	45 45 \$103,692,000	24 \$1,108,000	380 \$2,420,000	115 1,339 \$271,700,000	
Alternative S3 - Removal Option: 1-foot Clearance Explosive Breaching (Acres) Surface Clearance (Acres) Geophysical Survey/Data Management (Acres) 1-foot Clearance (Acres) Total Present Worth Cost (\$):	70 890 730 730 \$177,811,000	45 45 - - \$103,692,000	24 1.3 1.3 \$2,423,000	380 380 380 380 \$10,694,000	115 1,339 1,111 1,111 \$294,620,000	
Alternative \$3 - Removal Option: 4-feet Clearance Explosive Breaching (Acres) Surface Clearance (Acres) Geophysical Survey/Data Management (Acres) 4-foot Clearance (Acres) Total Present Worth Cost (\$):	70 890 730 730 \$204,350,000	45 45 - - \$103,692,000	24 1.3 1.3 \$2,470,000	380 380 380 380 \$24,131,000	115 1,339 1,111 1,111 \$334,643,000	
Alternative S3 - Removal Option: 10-feet Clearance Explosive Breaching (Acres) Surface Clearance (Acres) Geophysical Survey/Data Management (Acres) 10-foot Clearance (Acres) Total Present Worth Cost (\$):	70 890 640 640 \$1,116,516,000	45 45 - - \$103,692,000	24 1.3 1.3 \$5,315,000	380 320 320 \$691,798,000	115 1,339 961 961 \$1,917,321,000	

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UXO Sites: SWMU 1 SWMU 2 SWMU 8 SA 93

Andrew Lake Waste Ordnance Demolition Range

Causeway Minefield

Andrew Lake Landfill and Shoreline at SWMU 8 Mortar Impact Area